Offshore Index Assessment Program

2009 Summary Report

Upper Great Lakes Management Unit
Lake Huron
Report: PS-LHA-IA09-SUM

Ministry of
Natural Resources

Ministère des
Richesses naturelles

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J.D. Speers

Ontario Ministry of Natural Resources
Upper Great Lakes Management Unit
Lake Huron

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Table of Contents

Introduction **1**

Materials and Methods **3**

Results **6**

Georgian Bay (Cape Rich) *7*

Georgian Bay (Collingwood) *13*

Georgian Bay (Watcher Islands) *19*

Central Lake Huron (Southampton) - Fall *26*

Central Lake Huron (Stokes Bay) *33*

Southern Lake Huron (Grand Bend) - Spring *39*

Southern Lake Huron (Grand Bend) - Fall *47*

North Channel (Clapperton Island) *52*

North Channel (Cooperative Index) *58*

Pre-Recruit Indices *67*

Discussion **69**

Lake Whitefish *69*

Lake Trout *70*

Yellow Perch *71*

Chub *72*

Summary **72**

Acknowledgements **74**

References **74**

Introduction

The Lake Huron office of the Upper Great Lakes Management Unit conducts annual index gill net surveys throughout the Canadian waters of Lake Huron. These waters include the main basin, Georgian Bay, and the North Channel. These surveys are collectively known as the offshore index assessment program. Its purpose is to monitor the populations of commercially exploited fish species and to collect information about the offshore fish community. The primary objective of the offshore index program is to characterize the strength of the year classes of commercially exploited fish species before they are susceptible to commercial fishing gear. The offshore index program is also an important tool for measuring the progress of lake trout (*Salvelinus namaycush*) rehabilitation in the lake.

The offshore index program consists of overnight sets of standardized, monofilament gill nets set on the lake's bottom at various locations throughout Lake Huron (Figure 1). The offshore index program has remained essentially unchanged since its inception with only minor modifications to the sampling protocol due to logistical and financial constraints. As a result, the offshore index program provides an invaluable, long-term, trend-through-time record of the offshore fish community in Lake Huron.

This year the Ontario Ministry of Natural Resources also conducted a partnership assessment project with the Ontario Commercial Fisheries' Association to perform additional sampling in the North Channel using a commercial fishing vessel. This partnership is identified in this document as the North Channel cooperative index project. The methodology of this project differed slightly from that of the rest of the offshore index program. These differences are described in detail in the Methods section.

This report summarizes the individual offshore index projects conducted during 2009. Each project consisted of several net sets at a specific location during a specific time period. Any changes to the sampling process that deviated from the long-term protocol are described. Catch per unit of effort (CPUE), length-at-age, and pre-recruit indices are calculated for select species. Differences between the results of this and past field seasons are briefly discussed.

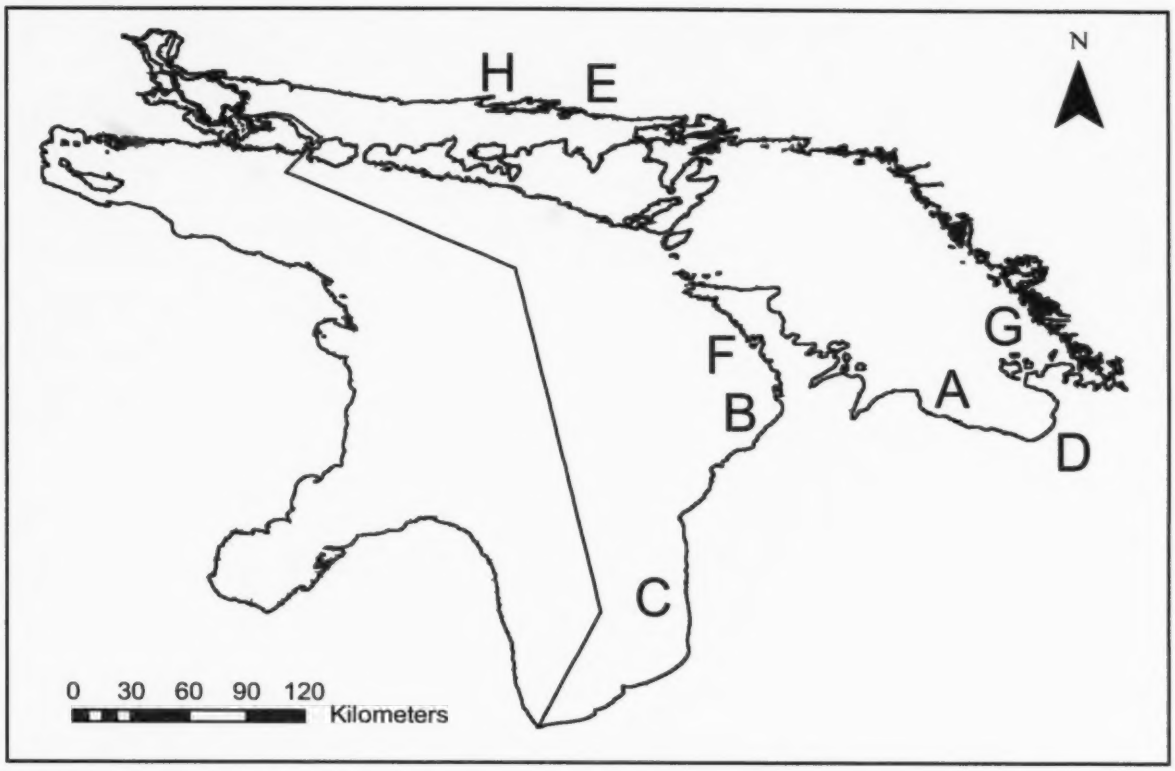

Figure 1. General locations of the offshore index assessment projects conducted in Lake Huron during 2009. The projects were conducted near Cape Rich (A), Southampton (B), Grand Bend (C), Collingwood (D), Clapperton Island (E), Stokes Bay (F), the Watcher Islands (G), and the North Channel (H).

Materials and Methods

Depending on project, the survey design of the offshore index program includes both a fixed and random component. Projects with a long-term time series are essentially fixed-site surveys where the index nets are set in roughly the same place every year to monitor the offshore fish community through time. Projects with a fixed-site survey design were the Cape Rich, Southampton, Grand Bend, and Clapperton Island projects. Projects without existing fixed stations employed a depth-stratified, randomized survey design. In these projects, net set locations were randomly selected within several depth strata from a 1 km grid overlay. The depths used to define these strata depends on the available habitat, project objective, and proximity to other offshore index projects. The actual depth strata that were used in each project are described in the Results section. Projects that used a randomized survey design were the Collingwood, Watcher Islands, Stokes Bay, Clapperton Island, and North Channel cooperative index projects. The Clapperton Island project incorporated both a random- and fixed-site component; nets set shallower than 15 m were set at historical sampling stations to maintain the long-term time series for yellow perch in the project, while the location of nets set in deeper water to target lake trout and lake whitefish were randomly selected from a 1 km grid overlay.

The offshore index program uses only multi-mesh monofilament gillnets. Usually three of these nets are set each day. All of the nets consisted of a 15 m panel of 32 mm (1.25" stretch measure) mesh, a 25 m panel of 38 mm (1.5") mesh, and 50 m panels of 51 mm (2.0"), 64 mm (2.5"), 76 mm (3.0"), 89 mm (3.5"), 102 mm (4.0"), 114 mm (4.5"), and 127 mm (5.0") mesh ordered from smallest mesh to largest mesh. This gear is identified as GL32. A 50 m panel of 140 mm (5.5" stretch measure) mesh and a 50 m panel of 165 mm (6.5") mesh were added to the third net. The order of the meshes in this net, identified as GL21, was randomized between projects and seasons. The collection of the individual panels that make up each net are referred to here as a net "gang". During most projects, the nets were set perpendicular to the depth contours to maximize the catch and to reduce the variability between catches. However, some of the nets were set parallel to the depth contours during the North Channel (Clapperton Island) project due to rapid changes in depth in that area. Nets are always set on the lake's bottom. The offshore index program was conducted exclusively from the Ontario Ministry of Natural Resources' research vessel, the *Atigamayg*. The only exception to these last two statements occurred, by design, during the North Channel cooperative index.

Methodology differed slightly during the North Channel cooperative index. While all nets were set perpendicular to the depth contours, approximately one-third of the nets were set above the lake's

bottom (canned). The depth at which the bottom of these nets were set below the water's surface was 17 m or half of the water depth if the water depth was less than 20 m. Only GL21 gear was used. This project was conducted from a commercial fishing vessel.

Detailed information was collected about each net set. Latitude, longitude, Secchi depth, weather conditions, and surface water temperature were recorded. The water depth and water temperature at depth at each mesh was also noted. Set duration lasted between 20 and 24 hours unless unsafe conditions were created by inclement weather. Instances where weather prevented net retrieval for an extended period of time were accounted for in calculations of relative abundance by using effective net nights to compensate for gear saturation. If a net fished for more than one night, the number of nights fished was adjusted by a factor of 0.7. Thus a net that fished for two consecutive nights was considered to have fished for 1.4 effective net nights for the purposes of CPUE calculations (0.7 x 2 = 1.4).

Biological information was collected from the catch. As each net was lifted the catch was segregated by mesh size into containers to facilitate the collection of biological information by mesh size. Fork length, total length, aging structures (if required), and round weight were measured for up to 20 individuals of each species from each mesh size. In instances where more than 20 individuals of a single species were captured in one mesh size, a sub-sample of 20 was randomly selected for these biological measurements. Fork length and aging structures (if required) were collected from the next 30 individuals. All remaining individuals were counted. Sea lamprey (*Petromyzon marinus*) marks were recorded using Great Lakes Fishery Commission standards (Ebener et al. 2006) from all of the fish that were sampled. Salmonids and lake whitefish (*Coregonus clupeaformis*) were examined for clipped fins. Depending on the objectives of the individual project, any combination of aging structures (scales, otoliths, or fin rays), stomachs, or tissue samples may have been collected as well.

The structure used to age each fish varied by species. Age was determined from scale samples for most species. Cisco (*Coregonus artedi*) were aged using otoliths. Lake trout were assigned an age based on their clipped fins or a coded wire tag number. Lake trout without a coded wire tag or an unambiguous, year-specific fin clip were assigned an age using otoliths.

If sufficient biological information was collected, more information about a species' population was calculated. If enough age and length data were available from a particular species and project, a Von Bertalanffy growth curve was estimated. If enough maturity data was also collected, age-at-maturity was estimated using logistic regression. Growth and maturity curves were generated separately for males and females.

Average CPUE is listed for each species in each summary table. In most instances, CPUE was the average number of fish of a given species caught in those nets where at least one individual of that species was caught. This is appropriate for non-target species because a number of nets were set that would not be expected to catch those species. For example, nets targeting bloater (*Coregonus hoyi*) would not be expected to catch species found in shallower water, such as smallmouth bass (*Micropterus dolomieu*). Consequently the bloater-targeting nets should not be included in the calculation of average CPUE for smallmouth bass. However, for target species the average CPUE includes the catch from only net sets targeting that species, even if that species was not caught. The offshore index program targets lake trout, lake whitefish, "deepwater" chub (cisco other than *Coregonus artedi*), and yellow perch (*Perca flavescens*).

Pre-recruit indices (Hughes 1989) were calculated for some commercially exploited species caught during the program. The pre-recruit index uses age-specific CPUE data to infer the relative abundance of cohorts before they are susceptible to commercial fishing gear (referred to here as "pre-recruits"). The age-specific CPUE values are standardized to a value of ten to allow comparisons between year classes. Values greater than ten indicate that a year class is stronger than average (greater than average abundance) while a value less than ten indicates that a year class is weaker than average (Mohr et al. 1997). The index values listed in this report are an average of up to four age-specific, standardized CPUE values from each year class, depending on species and project.

Results

Projects were conducted in both traditional and new locations. Georgian Bay (near Cape Rich), the central main basin (near Southampton), the southern main basin (near Grand Bend), and the North Channel (near Clapperton Island) were the traditional locations that were sampled this year. Two projects were conducted in the southern portion of the main basin near Grand Bend, one in the spring (June/July) and another in the fall (October). Four new locations were selected this year in which to run a project to increase the spatial coverage of the offshore index program; near Stokes Bay in the central main basin, the waters surrounding the Watcher Islands in Georgian Bay, offshore of Collingwood in Georgian Bay, and the central portion of the North Channel. The location of all projects are shown in Figure 1.

The 208 nets (90.120 km of gear) set this year captured a total of 27 fish species and 5 494 individuals. Of these, 3 945 were biologically sampled. The most common species were yellow perch (44 % of catch), lake whitefish (15 %), and white sucker (*Catostomus commersoni*, 9 %). Of the 322 lake trout that were sampled, 73 (22.7 %) were unclipped and presumed to be naturally produced. This proportion is among the highest ever observed in the offshore index program but roughly one-third less than the record high percentage from last year. This decline is likely due to the fact that no project was run in South Bay in 2009, an area which caught a large proportion of unclipped lake trout in 2008.

Georgian Bay (Cape Rich) **[LHA_IA09_002]**

This project was conducted in Georgian Bay near Cape Rich between August 10 and September 02 (Table 1). The depth of the nets ranged between 18.4 m and 90.4 m. All 18 net sets were approximately 24 hours in duration. Lake trout and lake whitefish were targeted. Although some nets are typically fouled by algae in this area, none of the nets were fouled by algae this year. The position of each net is shown in Figure 2.

Thirteen fish species were caught during this project (Table 2). Three more species were caught last year. This decrease in species diversity may be due to decreased effort; 12 fewer nets were set this year. Lake sturgeon (*Acipenser fulvescens*), rock bass (*Ambloplites rupestris*), and brown trout (*Salmo trutta*) were caught last year but not this year. The most common species caught during this year's program were lake trout (22.6 % of catch), lake whitefish (21.8 %), and white sucker (21.8 %). Plots of the biological attributes of the lake trout (Figure 3), lake whitefish (Figure 4), and chub (Figure 5) captured during this project were constructed.

Average CPUE for this project was 20.4 fish/night. Almost all of the chub were caught in the 32 mm mesh. White sucker had the highest average CPUE (16.0), followed by chub (12.0), and longnose sucker (*Catostomus catostomus*, 9.0).

Table 1. Set information for the fishing gear deployed in Georgian Bay near Cape Rich during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
201	10-Aug-09	44° 42.29'	-80° 37.21'	GL32	23.70	19.7
202	10-Aug-09	44° 41.82'	-80° 37.49'	GL32	23.06	18.4
203	10-Aug-09	44° 40.86'	-80° 32.69'	GL21	21.71	90.4
204	11-Aug-09	44° 42.34'	-80° 36.04'	GL32	22.98	36.6
205	11-Aug-09	44° 41.78'	-80° 36.40'	GL32	23.08	34.8
206	11-Aug-09	44° 40.80'	-80° 34.95'	GL21	21.76	47.7
207	12-Aug-09	44° 40.06'	-80° 35.75'	GL32	22.63	49.3
208	12-Aug-09	44° 40.59'	-80° 35.38'	GL32	23.31	47.2
209	12-Aug-09	44° 41.13'	-80° 36.44'	GL21	23.86	37.2
210	27-Aug-09	44° 42.15'	-80° 37.43'	GL32	22.35	21.0
211	27-Aug-09	44° 41.71'	-80° 37.07'	GL32	22.71	21.7
212	27-Aug-09	44° 40.85'	-80° 33.06'	GL21	22.25	84.8
213	31-Aug-09	44° 40.59'	-80° 34.54'	GL32	23.41	47.9
214	31-Aug-09	44° 40.75'	-80° 35.12'	GL32	23.54	46.6
215	31-Aug-09	44° 40.55'	-80° 35.72'	GL21	23.68	48.5
216	01-Sep-09	44° 41.01'	-80° 35.96'	GL32	23.75	39.2
217	01-Sep-09	44° 41.60'	-80° 36.37'	GL32	24.48	35.8
218	01-Sep-09	44° 42.15'	-80° 36.70'	GL21	25.06	32.2

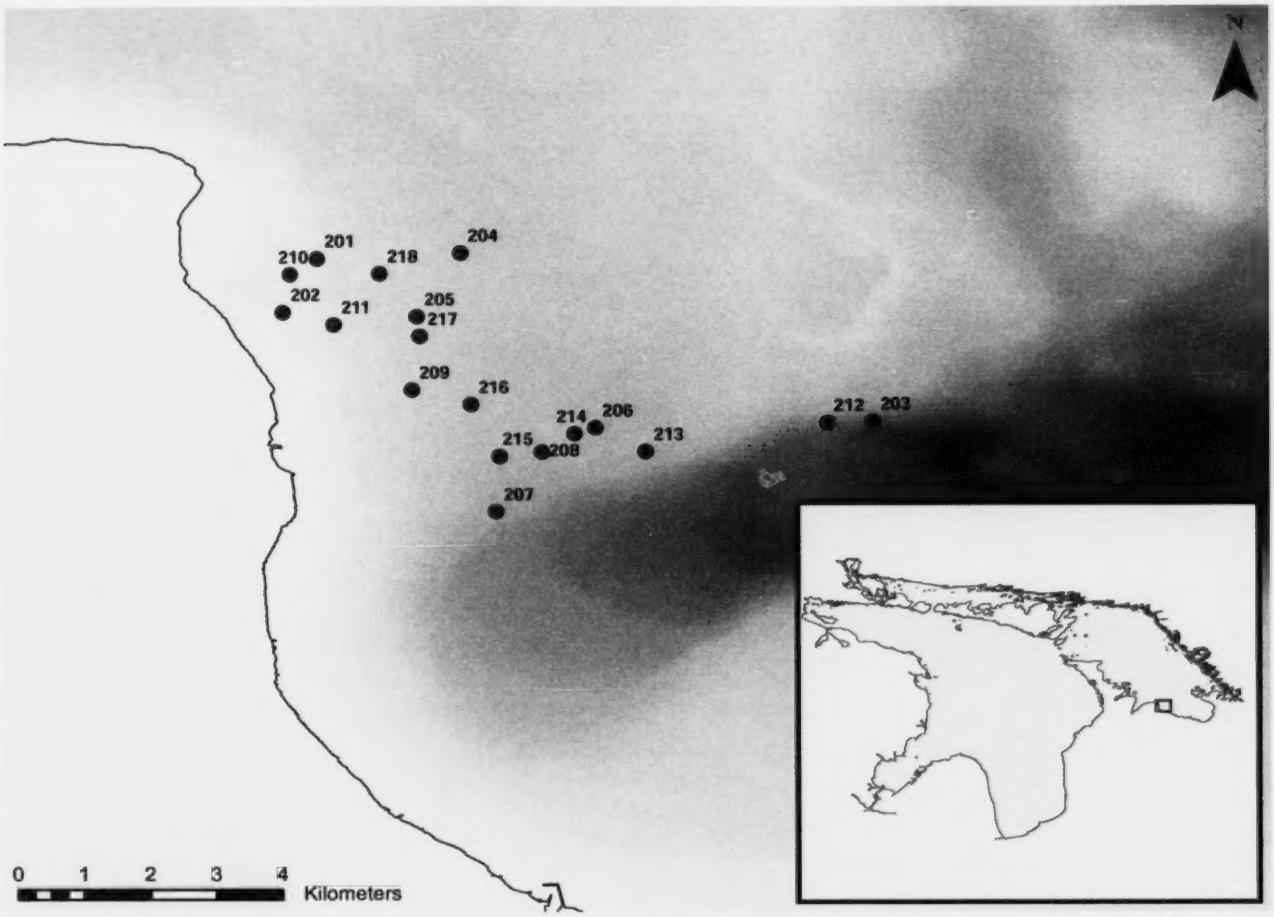

Figure 2. Offshore index sampling locations in Georgian Bay near Cape Rich during 2009 (project code LHA_IA09_002). Chub, lake trout, lake whitefish and yellow perch were targeted.

Table 2. Count of the number of fish by species caught in each mesh size of the gill nets set in Georgian Bay near Cape Rich during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Burbot			4	3	1		1					9	1.29
Chinook Salmon	2	5							1			8	2.67
Chub	25	2	1									28	12.00
Lake Chub	11	5										16	5.33
Lake Trout		1	1	3	10	12	18	18	12	2	6	83	5.33
Lake Whitefish		6	2	9	20	14	11	10	4	1	3	80	2.50
Longnose Sucker		2	1		10	10	10	3				36	9.00
Rainbow Smelt		1	1									2	2.00
Rainbow Trout			1		1							2	2.00
Round Goby	1	1										2	2.00
Round Whitefish		3	4	2								9	2.25
White Sucker			12	7	13	9	14	14	11			80	16.00
Yellow Perch		11	1									12	3.00
Total	39	37	28	24	55	45	54	45	28	3	9	367	

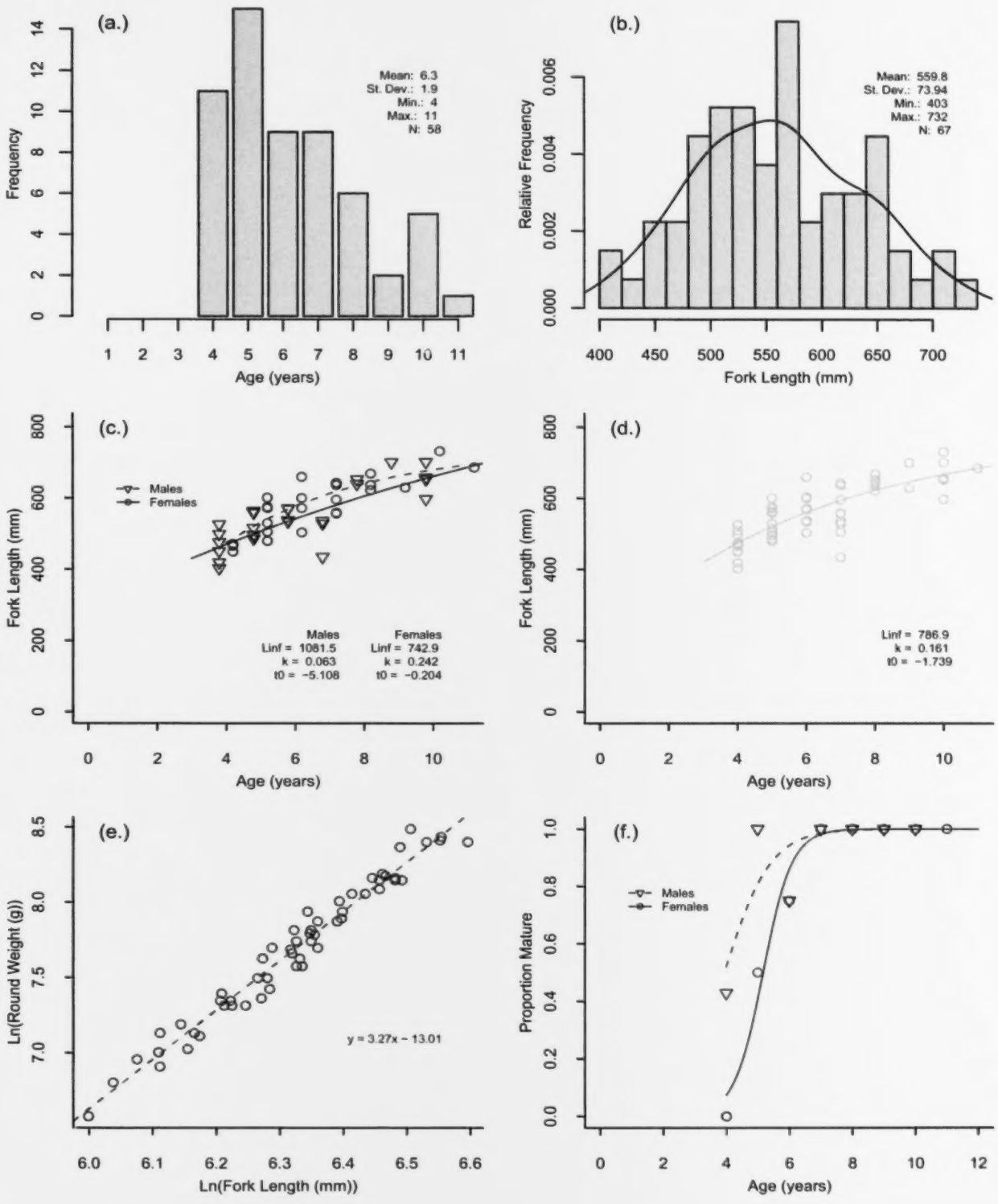

Figure 3. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Cape Rich project (LHA_IA09_002).

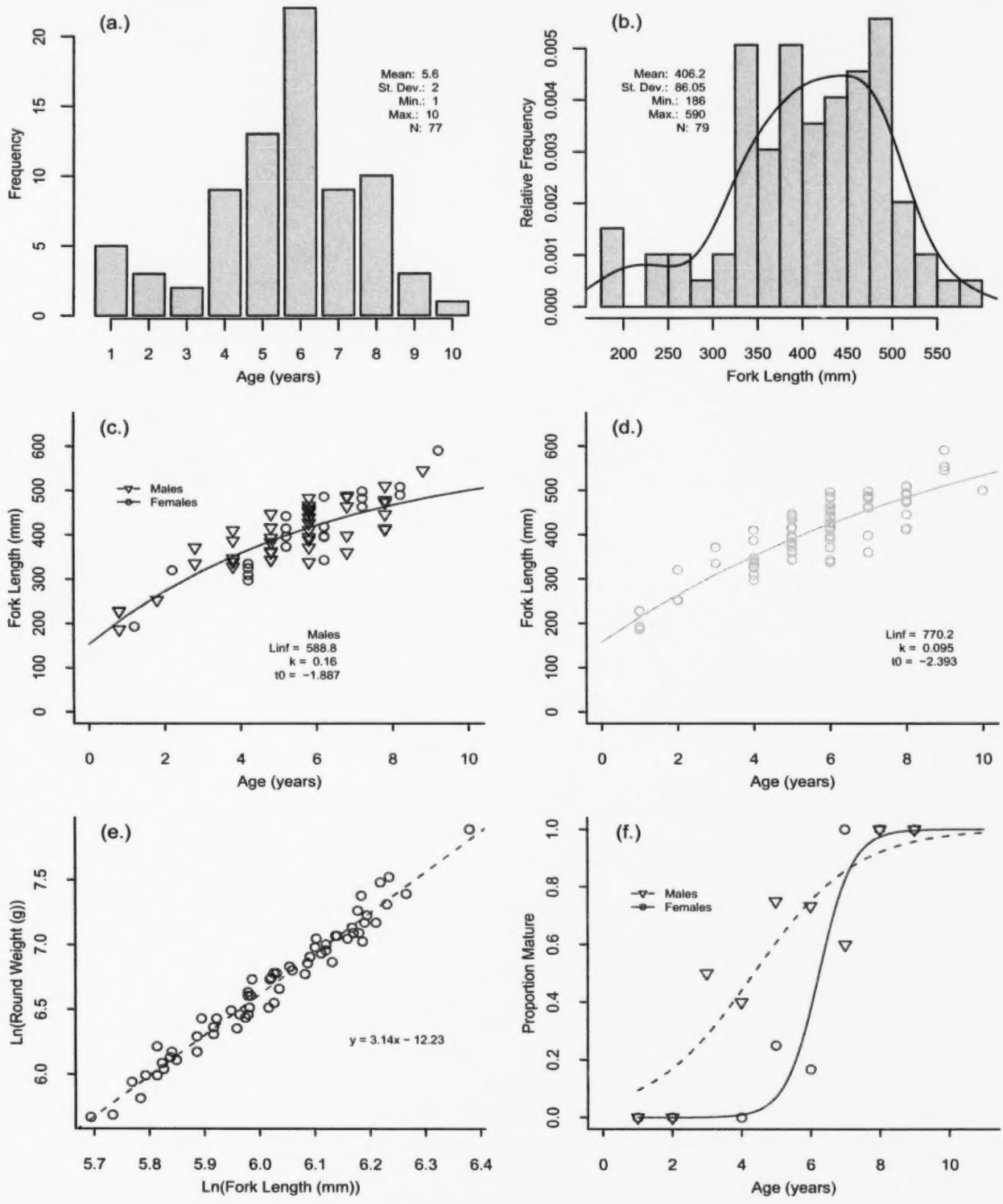

Figure 4. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Cape Rich project (LHA_IA09_002).

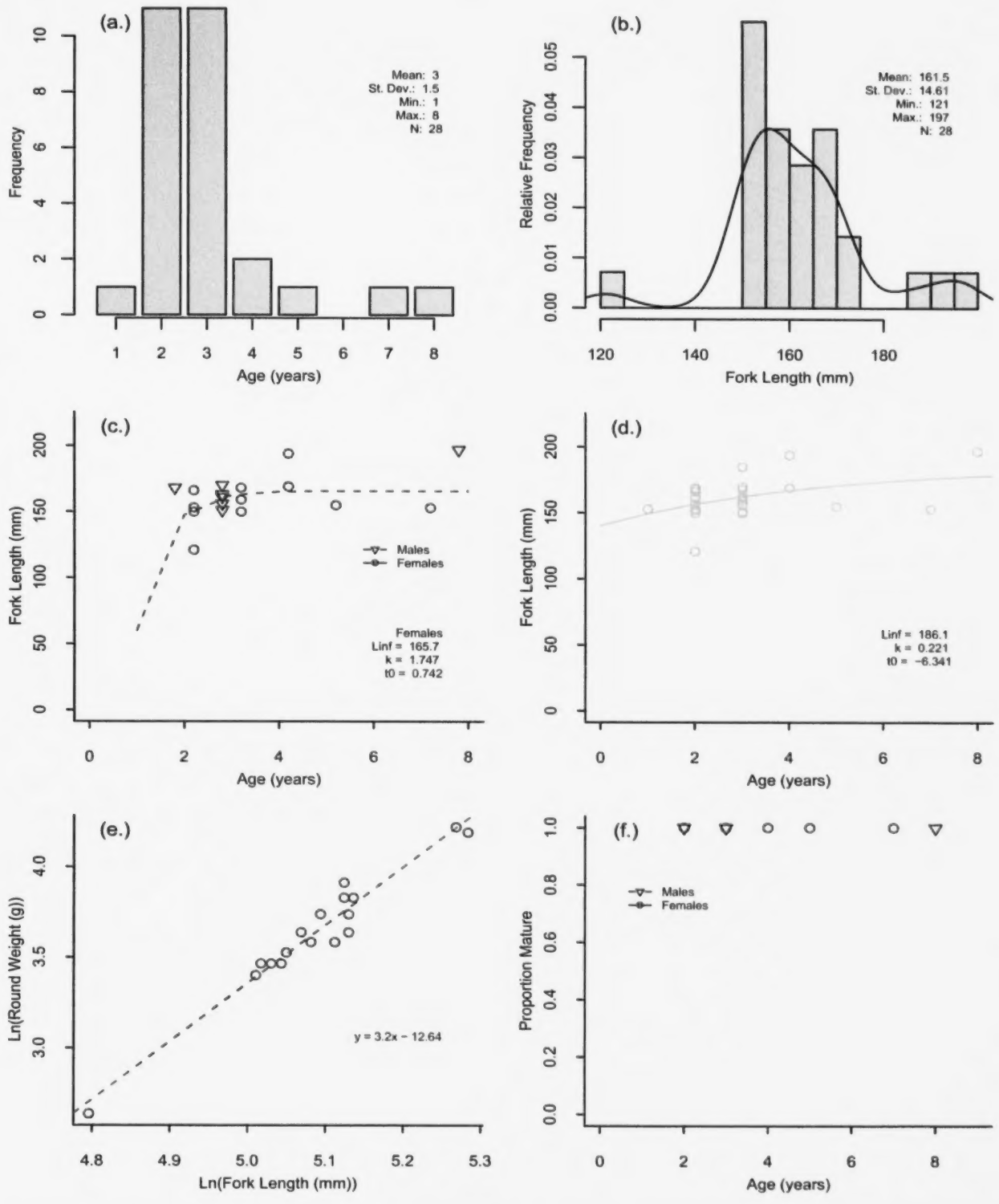

Figure 5. Chub age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Cape Rich project (LHA_IA09_002).

Georgian Bay (Collingwood) **[LHA_IA09_003]**

This project was conducted in Georgian Bay near Collingwood between August 13 and August 26 (Table 3). This project was run to evaluate the progress towards lake trout rehabilitation in the area. The depth of the nets ranged between 10.0 m and 69.9 m and encompassed four depth strata: <25 m, 25-45 m, 45-60 m, and >60 m. All 21 net sets were approximately 24 hours in duration. Lake trout, lake whitefish, and yellow perch were sought. The position of each net is shown in Figure 6.

Seventeen fish species were caught during this project (Table 4). The most common species were yellow perch (29.5 % of catch), longnose sucker (13.2 %), and lake whitefish (10.9 %). Plots of the biological attributes of the lake whitefish (Figure 7), round whitefish (*Prosopium cylindraceum*) (Figure 8), and yellow perch (Figure 9) captured during this project were constructed.

Average CPUE for this project was 14.4 fish/night. Longnose sucker had the highest average CPUE (20.0), followed by round whitefish (9.3), and yellow perch (9.1). Eight of the ten alewife (*Alosa pseudoharengus*) caught during the entire index program were caught during this project.

Table 3. Set information for the fishing gear deployed in Georgian Bay near Collingwood during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
301	13-Aug-09	44° 35.92'	-80° 15.66'	GL32	21.85	65.4
302	13-Aug-09	44° 35.25'	-80° 17.37'	GL32	22.11	22.3
303	13-Aug-09	44° 36.98'	-80° 17.20'	GL21	21.33	65.1
304	17-Aug-09	44° 40.19'	-80° 11.99'	GL32	24.08	67.1
305	17-Aug-09	44° 37.92'	-80° 12.84'	GL32	23.00	68.9
306	17-Aug-09	44° 36.86'	-80° 13.60'	GL21	22.06	69.9
307	18-Aug-09	44° 42.23'	-80° 10.18'	GL32	23.86	59.4
308	18-Aug-09	44° 40.14'	-80° 10.53'	GL32	22.76	62.9
309	18-Aug-09	44° 38.49'	-80° 08.37'	GL21	21.71	53.2
310	19-Aug-09	44° 41.64'	-80° 05.32'	GL32	20.73	35.6
311	19-Aug-09	44° 41.49'	-80° 03.20'	GL32	20.95	17.6
312	19-Aug-09	44° 40.93'	-80° 01.55'	GL21	21.16	12.2
313	20-Aug-09	44° 34.70'	-80° 06.80'	GL32	22.13	43.7
314	20-Aug-09	44° 36.30'	-80° 03.40'	GL32	23.18	27.4
315	20-Aug-09	44° 38.97'	-79° 59.96'	GL21	24.45	12.1
316	24-Aug-09	44° 33.05'	-80° 01.22'	GL32	23.16	10.0
317	24-Aug-09	44° 34.72'	-80° 03.04'	GL32	22.91	19.2
318	24-Aug-09	44° 32.56'	-80° 07.43'	GL21	22.63	42.4
319	25-Aug-09	44° 34.10'	-80° 01.96'	GL32	23.71	15.5
320	25-Aug-09	44° 30.89'	-80° 03.74'	GL32	23.38	12.6
321	25-Aug-09	44° 33.61'	-80° 11.28'	GL21	20.68	56.6

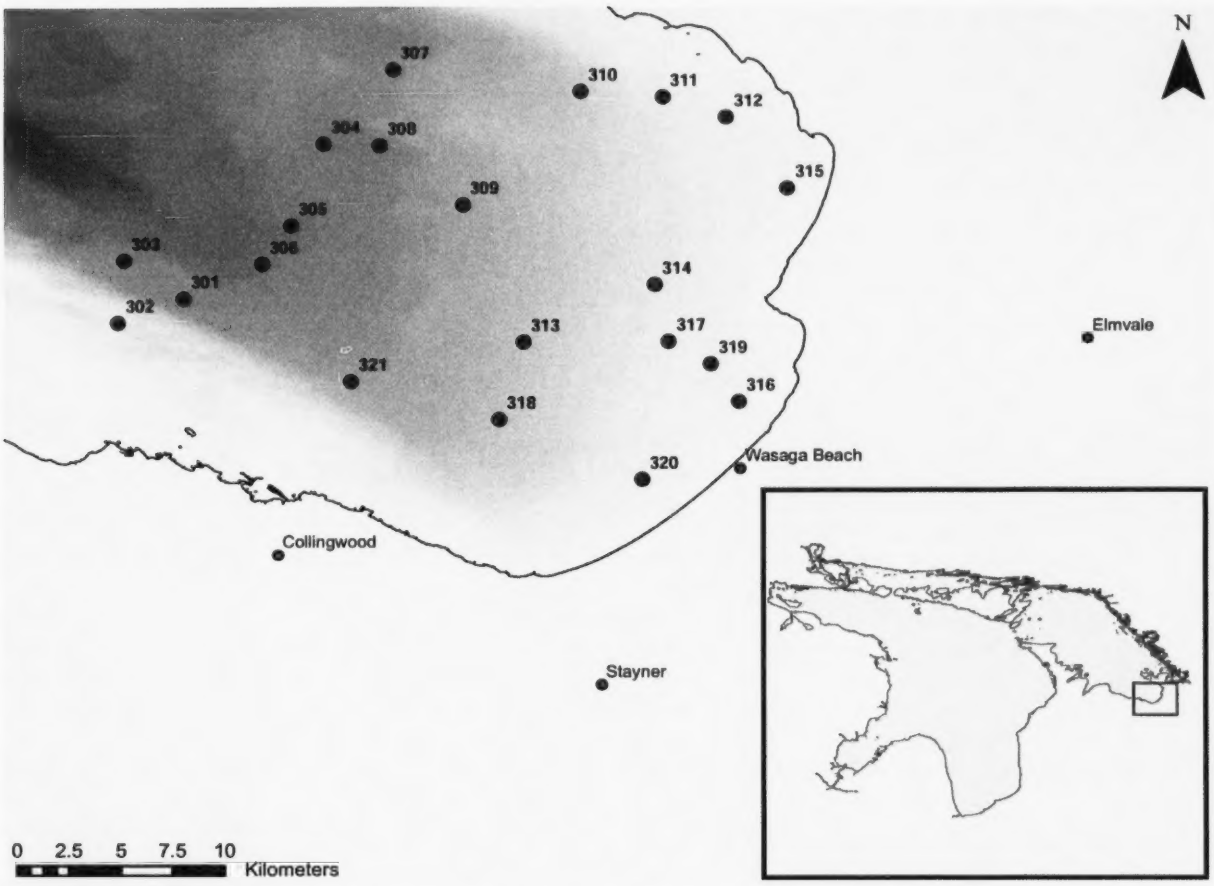

Figure 6. Offshore index sampling locations in Georgian Bay near Collingwood during 2009 (project code LHA_IA09_003). Lake trout, lake whitefish, and yellow perch were targeted.

Table 4. Count of the number of fish by species caught in each mesh size of the gill nets set in Georgian Bay near Collingwood during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Alewife	4	4										8	2.67
Burbot		2	1			1			1			5	1.67
Channel Catfish				1			1					2	2.00
Chinook Salmon	7	7	5			1			1	1		22	4.40
Chub	2	1	1				1					5	2.50
Lake Chub	5											5	2.50
Lake Sturgeon				2	3	1	1	1	4		1	13	3.25
Lake Trout				1	3			1	1			6	0.20
Lake Whitefish		5	6	1	4	5	3	7	2			33	7.00
Longnose Sucker				4	6	6	18	5	1			40	20.00
Rainbow Smelt		1	4	2	1	1						9	4.50
Rainbow Trout		1	1	2								4	2.00
Round Goby	1											1	1.00
Round Whitefish			7	14	5	1		1				28	9.33
Smallmouth Bass						1						1	1.00
White Sucker	2	3	3			1	4	6	12			31	6.20
Yellow Perch	60	19	10									89	9.14
Total	81	43	38	27	22	18	28	21	22	1	1	302	

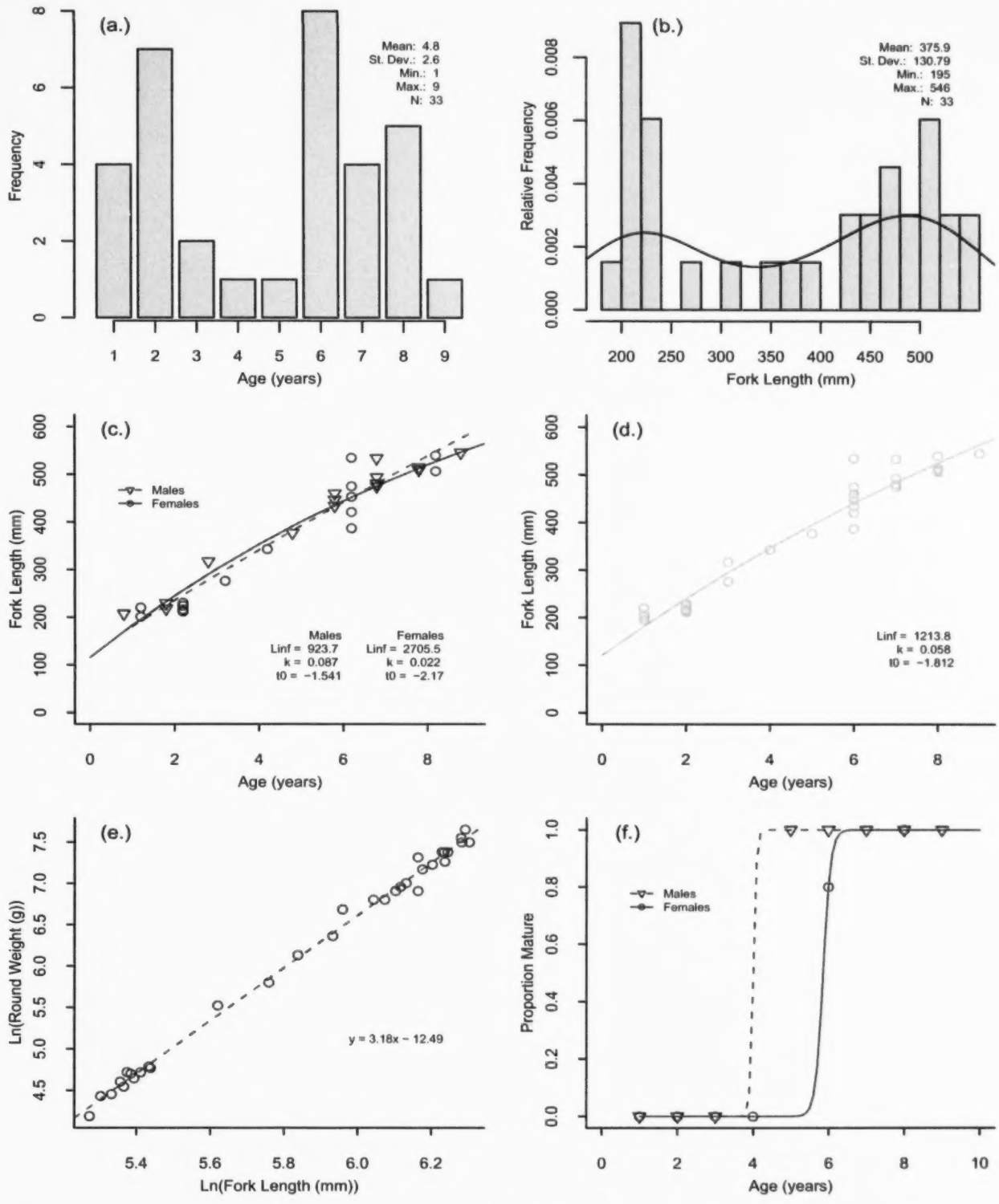

Figure 7. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Collingwood project (LHA_IA09_003).

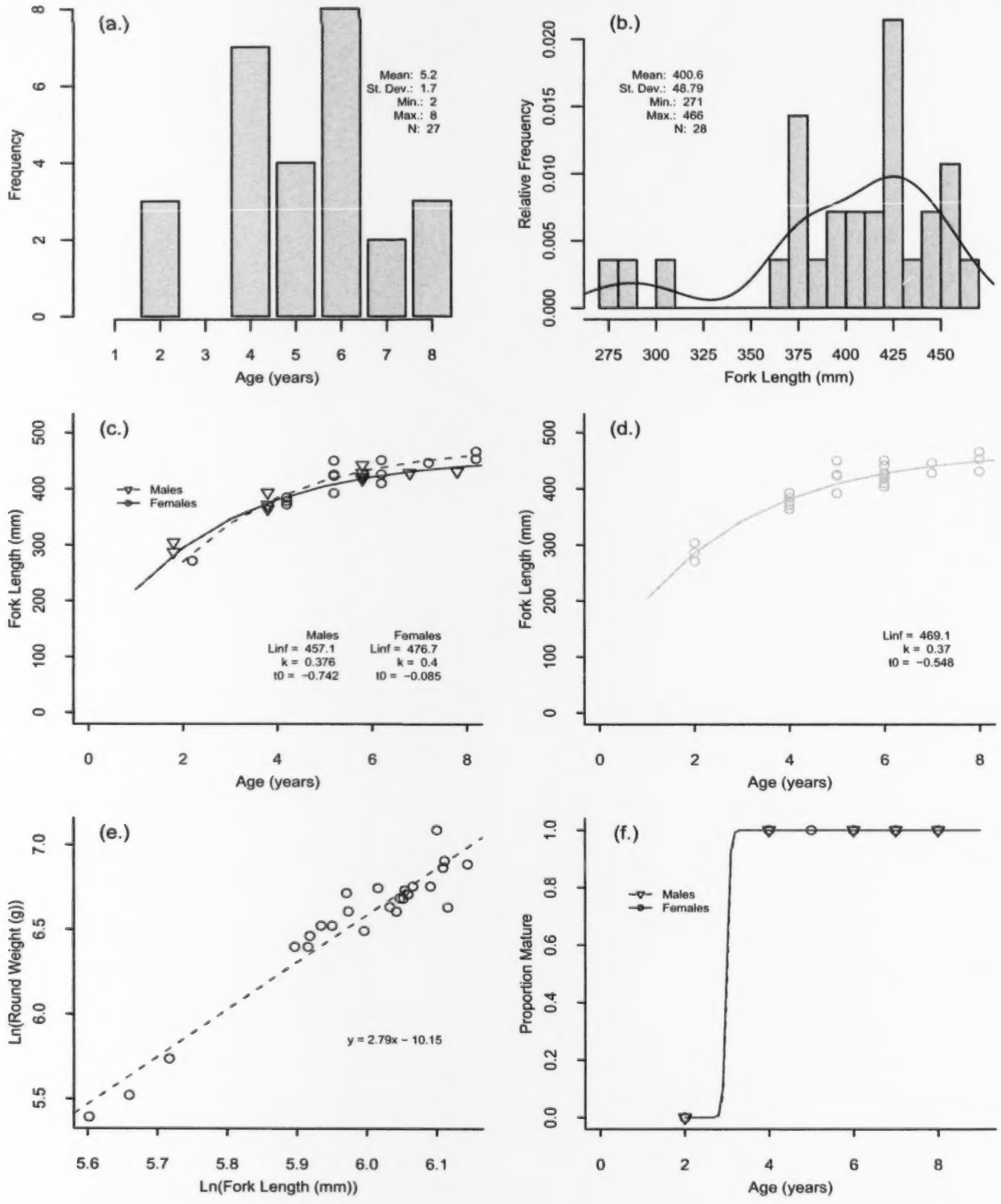

Figure 8. Round whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Collingwood project (LHA_IA09_003).

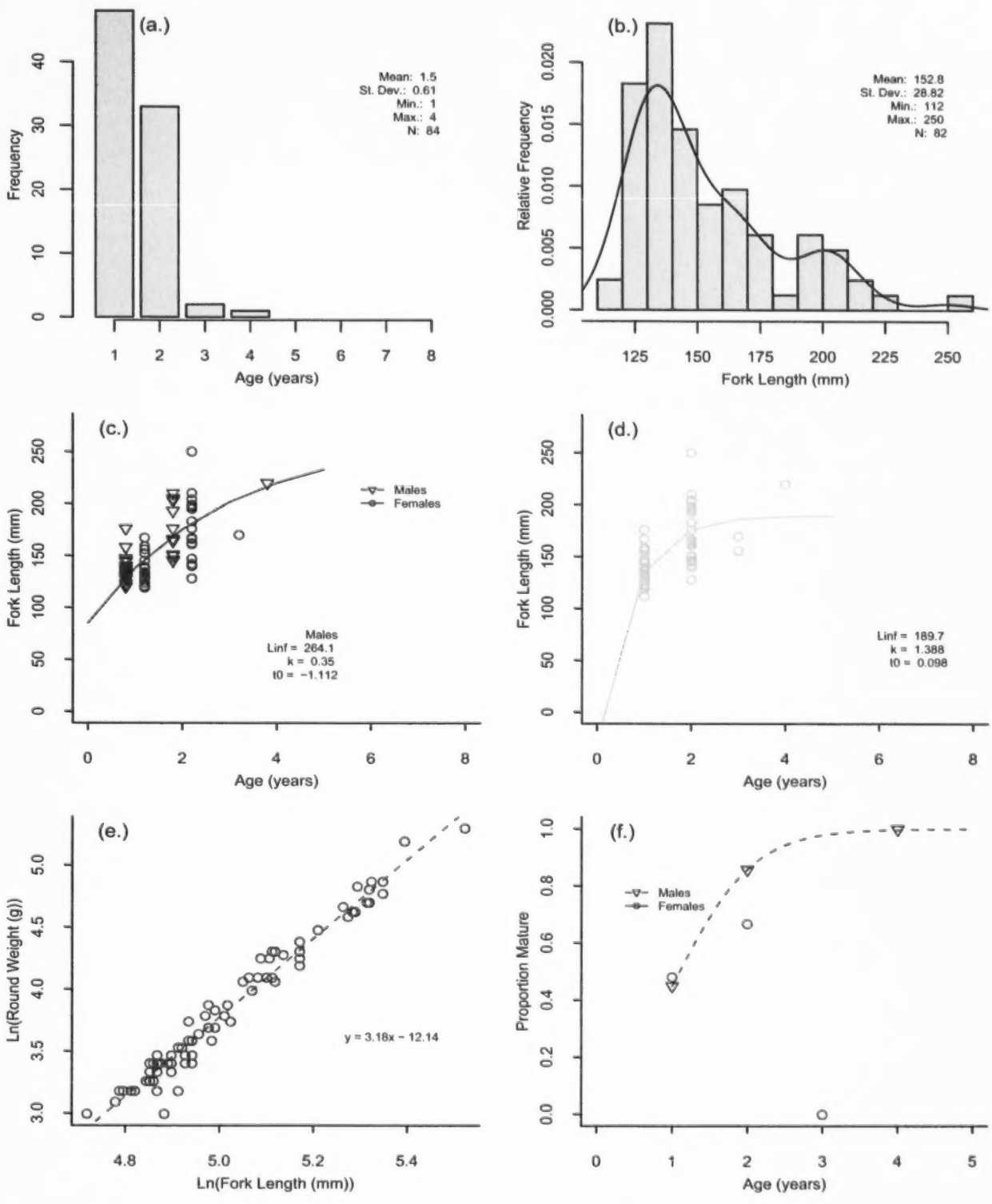

Figure 9. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Collingwood project (LHA_IA09_003).

Georgian Bay (Watcher Islands) **[LHA_IA09_027]**

This first-time index project was run in Georgian Bay near the Watcher Islands between July 20 and August 06 (Table 5). This project was run to evaluate the progress towards lake trout rehabilitation in the area. The depth of the nets ranged between 10.7 m and 72.0 m and encompassed three depth strata: <25 m, 30-50 m, and >60 m. All 30 net sets were approximately 24 hours in duration. The position of each net is shown in Figure 10.

Eighteen fish species were caught during this project (Table 6). The most common species were yellow perch (53.7 % of the catch), rock bass (10.0 %), and lake whitefish (6.6 %). Plots of the biological attributes of the lake trout (Figure 11), lake whitefish (Figure 12), round whitefish (Figure 13), and yellow perch (Figure 14) captured during this project were constructed.

Average CPUE for this project was 23.2 fish/night. Rock bass had the highest mean CPUE (11.7), followed by round goby (*Neogobius melanostomus*, 4.0), and lake whitefish (3.8). Lake trout were caught in every mesh size except the largest (153 mm) mesh size.

Table 5. Set information for the fishing gear deployed in Georgian Bay near the Watcher Islands during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
2701	20-Jul-09	44° 59.15'	-80° 07.65'	GL32	19.95	39.6
2702	20-Jul-09	44° 59.35'	-80° 08.30'	GL32	20.10	42.8
2703	20-Jul-09	44° 58.65'	-80° 09.11'	GL21	20.26	54.1
2704	21-Jul-09	44° 59.02'	-80° 12.72'	GL32	22.95	64.5
2705	21-Jul-09	44° 59.56'	-80° 12.81'	GL32	22.71	69.5
2706	21-Jul-09	44° 59.88'	-80° 12.52'	GL21	22.35	72.0
2707	22-Jul-09	44° 57.42'	-80° 07.08'	GL32	21.75	43.9
2708	22-Jul-09	44° 55.13'	-80° 09.63'	GL32	21.98	14.2
2709	22-Jul-09	44° 56.95'	-80° 08.81'	GL21	21.88	48.5
2710	23-Jul-09	44° 52.10'	-80° 09.85'	GL32	22.03	39.7
2711	23-Jul-09	44° 51.04'	-80° 09.03'	GL32	21.36	24.6
2712	23-Jul-09	44° 51.09'	-80° 08.20'	GL21	20.63	41.6
2713	27-Jul-09	44° 54.02'	-80° 08.21'	GL32	20.51	46.0
2714	27-Jul-09	44° 52.68'	-80° 08.91'	GL32	20.31	46.5
2715	27-Jul-09	44° 53.35'	-80° 06.20'	GL21	20.73	46.7
2716	28-Jul-09	44° 57.83'	-80° 04.51'	GL32	22.11	20.2
2717	28-Jul-09	44° 58.39'	-80° 04.06'	GL32	22.33	21.3
2718	28-Jul-09	44° 57.26'	-80° 04.98'	GL21	21.91	10.7
2719	29-Jul-09	44° 57.33'	-80° 02.67'	GL32	22.88	36.2
2720	29-Jul-09	44° 58.36'	-80° 03.45'	GL32	23.56	12.5
2721	29-Jul-09	44° 55.71'	-80° 02.26'	GL21	21.73	42.3
2722	30-Jul-09	44° 59.91'	-80° 04.16'	GL32	23.68	21.9
2723	30-Jul-09	44° 59.43'	-80° 06.11'	GL32	22.46	39.6
2724	30-Jul-09	44° 59.36'	-80° 04.82'	GL21	22.56	16.7
2725	04-Aug-09	44° 51.52'	-80° 01.32'	GL32	20.88	16.5
2726	04-Aug-09	44° 53.60'	-80° 01.26'	GL32	18.89	19.3
2727	04-Aug-09	44° 53.39'	-80° 01.53'	GL21	19.60	23.4
2728	05-Aug-09	44° 52.01'	-80° 02.04'	GL32	22.65	41.6
2729	05-Aug-09	44° 50.25'	-80° 04.09'	GL32	20.56	50.1
2730	05-Aug-09	44° 52.72'	-80° 04.05'	GL21	21.58	49.0

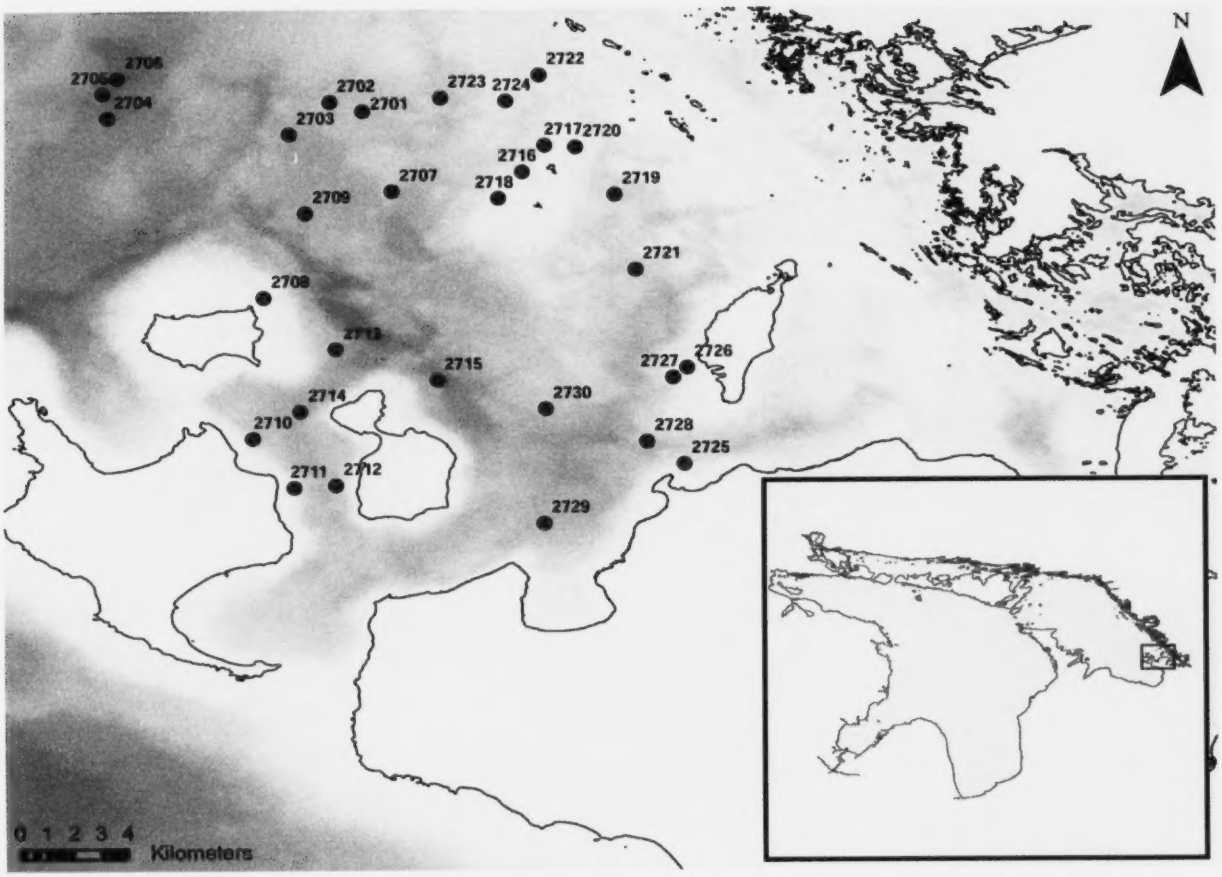

Figure 10. Offshore index sampling locations in Georgian Bay near the Watcher Islands during 2009 (project code LHA_IA09_027). Lake trout and yellow perch were targeted.

Table 6. Count of the number of fish by species caught in each mesh size of the gill nets set in Georgian Bay near the Watcher Islands during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Alewife	1											1	1.00
Burbot			9	11	8	2	4	1				35	2.69
Chinook Salmon	1											1	1.00
Chub	7	10										17	2.83
Cisco			2	1	1	1	1					6	1.50
Lake Chub	10	2										12	3.00
Lake Sturgeon							1		1			2	1.00
Lake Trout	1	2	10	9	8	8	4	1	1	1		45	1.61
Lake Whitefish	3		24	6		2	3	1	7			46	3.83
Longnose Sucker	2	2	3	3	2	4	1					17	1.89
Rainbow Smelt			2									2	1.00
Rock Bass		10	37	21	2							70	11.67
Round Goby	4											4	4.00
Round Whitefish	4	2	3	6	1	4						20	3.33
Smallmouth Bass			1	4		1			1			7	2.33
Walleye					2	4	10		2	1		19	3.17
White Sucker	1	1	3	5	2	6	1					19	2.71
Yellow Perch	275	54	40	5								374	3.00
Total	309	83	134	71	26	32	25	3	12	2	0	697	

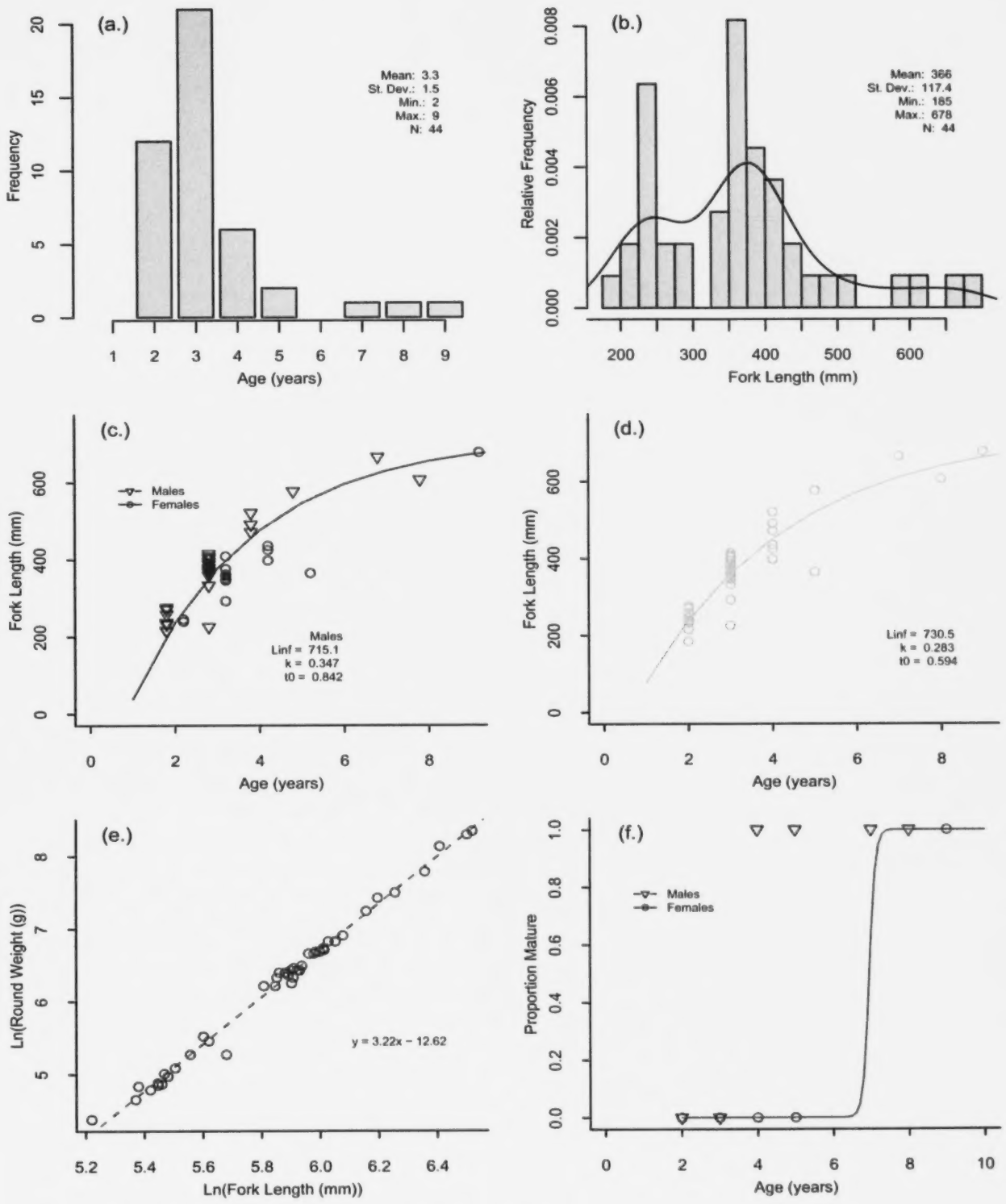

Figure 11. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Watcher Islands project (LHA_IA09_027).

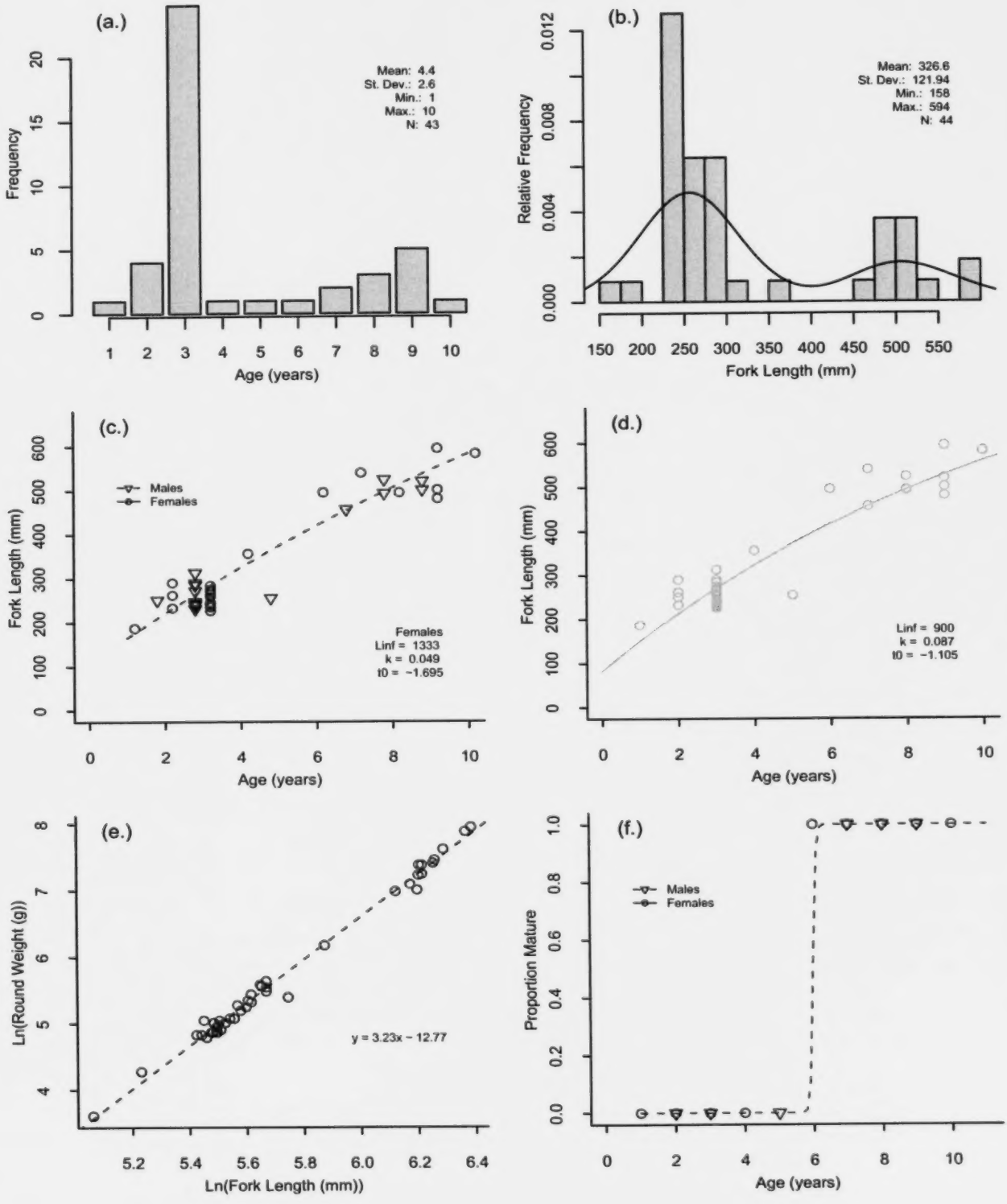

Figure 12. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Watcher Islands project (LHA_IA09_027).

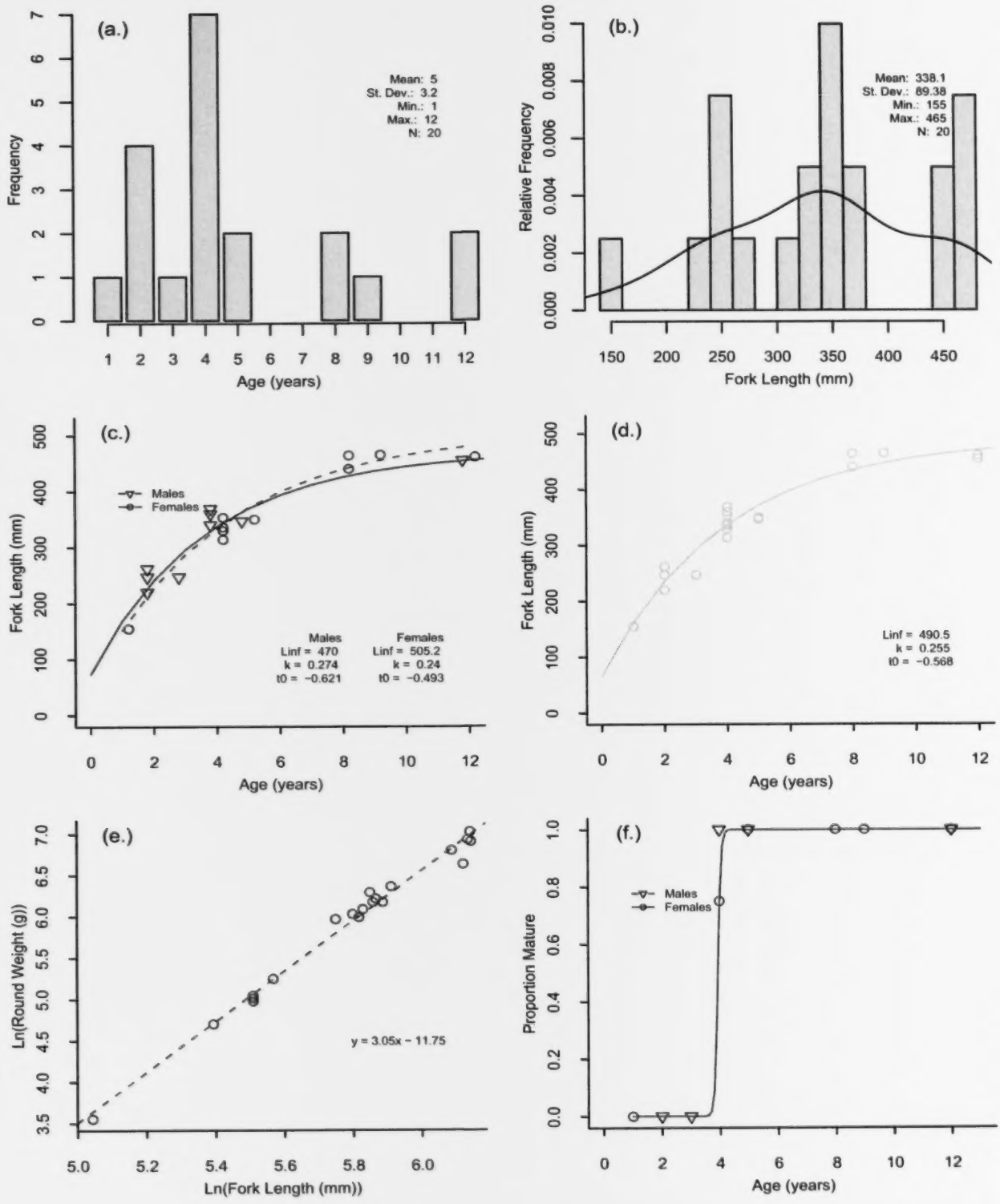

Figure 13. Round whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Watcher Islands project (LHA_IA09_027).

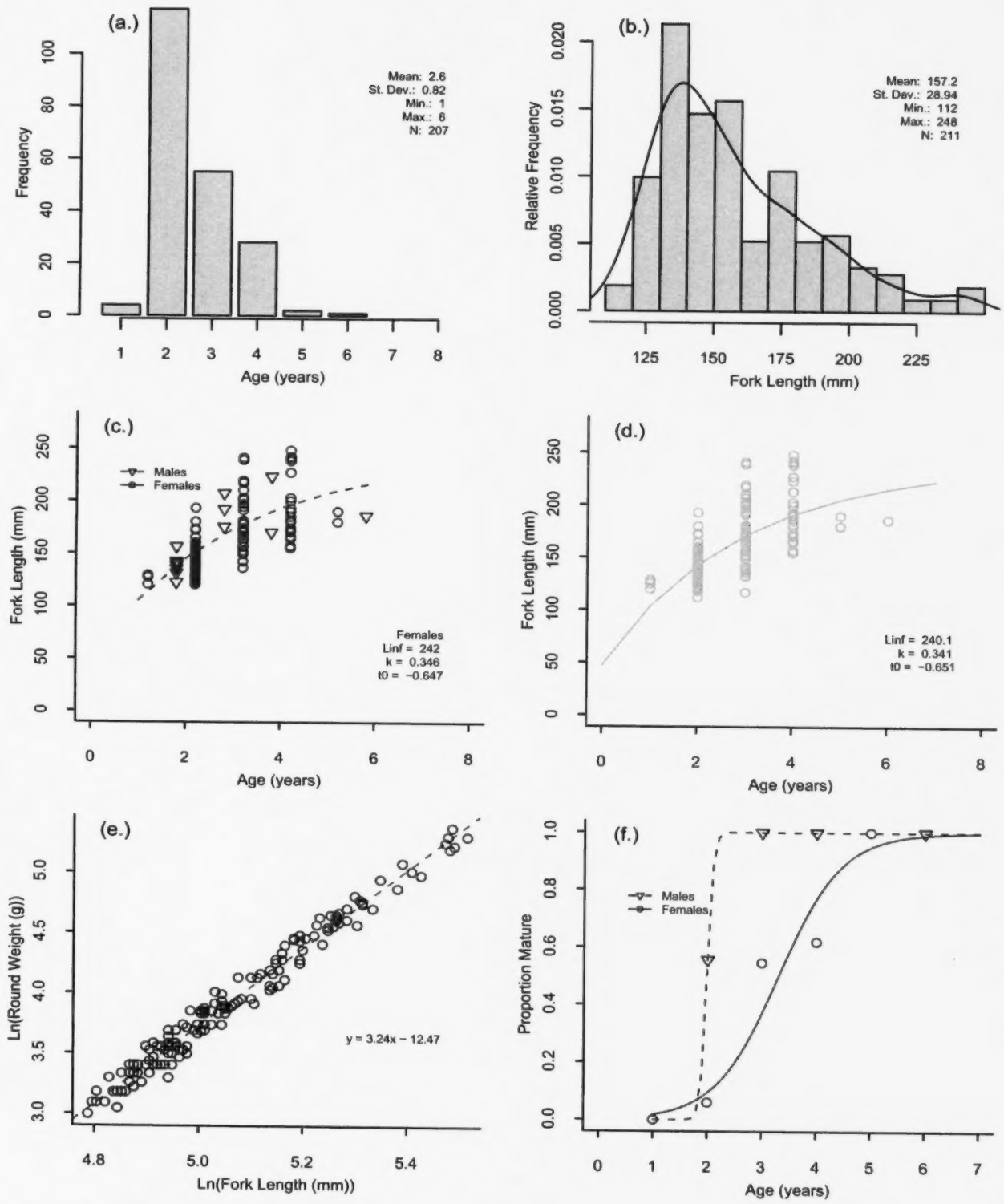

Figure 14. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Watcher Islands project (LHA_IA09_027).

Central Lake Huron (Southampton) - Fall **[LHA_IA09_005]**

This project was conducted in the central main basin near Southampton between September 08 and September 25 (Table 7). The depth of the nets ranged between 13.8 m and 91.0 m. All 27 net sets were approximately 24 hours in duration. Chub, lake whitefish, and yellow perch were sought. The position of each net is shown in Figure 15.

Thirteen fish species were caught during this project (Table 8), two fewer than the number caught last year. The most common species were yellow perch (22.4 % of catch), chub (17.5 %), and lake trout (16.9 %). Plots of the biological attributes of the lake trout (Figure 16), lake whitefish (Figure 17), chub (Figure 18), and yellow perch (Figure 19) captured during this project were constructed.

Average CPUE for this project was 11.4 fish/night. Yellow perch had the highest mean CPUE (11.5), followed by chinook salmon (*Oncorhynchus tshawytscha*, 7.0), and white sucker (6.4). Lake whitefish were caught in every mesh size except for the 32 mm mesh size.

Table 7. Set information for the fishing gear deployed in the fall in the central main basin near Southampton during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
551	08-Sep-09	44° 40.86'	-81° 28.84'	GL32	23.15	58.1
552	08-Sep-09	44° 41.52'	-81° 29.15'	GL32	23.31	59.1
553	08-Sep-09	44° 41.54'	-81° 27.49'	GL21	23.45	48.2
554	09-Sep-09	44° 41.56'	-81° 24.54'	GL32	22.55	35.6
555	09-Sep-09	44° 40.96'	-81° 24.88'	GL32	22.70	36.2
556	09-Sep-09	44° 41.60'	-81° 25.88'	GL21	22.26	39.4
557	10-Sep-09	44° 42.50'	-81° 18.97'	GL32	22.45	13.8
558	10-Sep-09	44° 41.94'	-81° 19.26'	GL32	22.61	13.8
559	10-Sep-09	44° 42.41'	-81° 20.31'	GL21	22.23	20.1
560	14-Sep-09	44° 36.87'	-81° 22.06'	GL32	23.36	30.8
561	14-Sep-09	44° 36.42'	-81° 22.61'	GL32	22.78	31.1
562	14-Sep-09	44° 36.22'	-81° 21.80'	GL21	22.18	26.9
563	15-Sep-09	44° 41.76'	-81° 22.47'	GL32	22.25	29.2
564	15-Sep-09	44° 41.20'	-81° 22.92'	GL32	22.41	30.7
565	15-Sep-09	44° 40.96'	-81° 21.83'	GL21	22.56	26.9
566	16-Sep-09	44° 37.06'	-81° 20.16'	GL32	21.50	21.9
567	16-Sep-09	44° 36.47'	-81° 20.71'	GL32	21.71	22.2
568	16-Sep-09	44° 36.27'	-81° 19.80'	GL21	21.75	19.3
569	17-Sep-09	44° 30.59'	-81° 24.66'	GL10	21.70	19.4
570	17-Sep-09	44° 30.11'	-81° 25.30'	GL10	21.15	19.4
571	17-Sep-09	44° 29.83'	-81° 25.53'	GL21	20.53	17.6
572	23-Sep-09	44° 31.28'	-81° 31.86'	GL32	21.75	57.3
573	23-Sep-09	44° 32.14'	-81° 31.50'	GL32	21.66	57.9
574	23-Sep-09	44° 32.65'	-81° 30.80'	GL21	21.78	53.4
575	24-Sep-09	44° 34.97'	-81° 24.55'	GL32	23.13	36.7
576	24-Sep-09	44° 35.63'	-81° 24.38'	GL32	23.36	38.2
577	24-Sep-09	44° 35.61'	-81° 23.97'	GL21	23.46	34.3

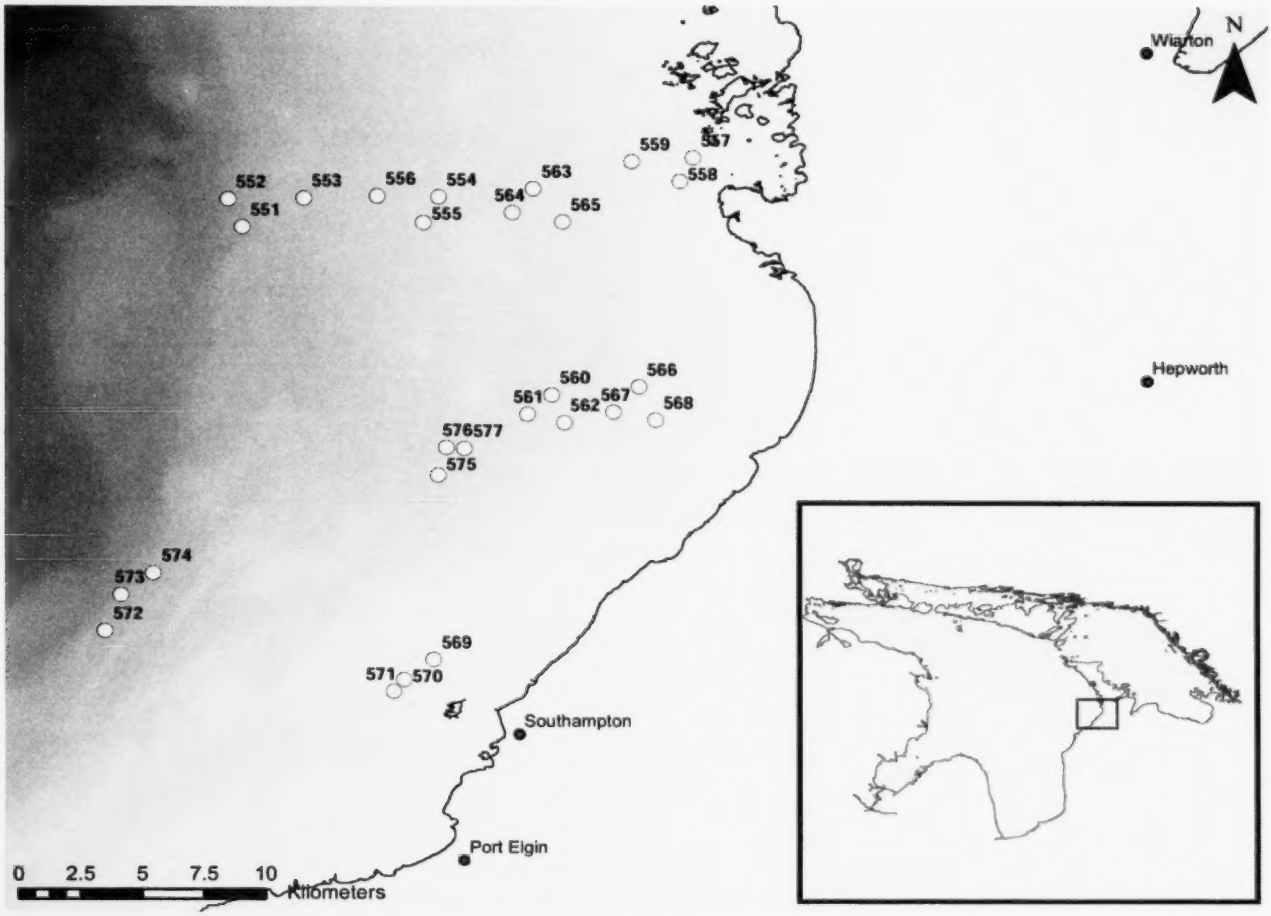

Figure 15. Offshore index sampling locations in the central main basin near Southampton during 2009 (project code LHA_IA09_005) during the fall (September). Chub, lake whitefish, and yellow perch were targeted.

Table 8. Count of the number of fish by species caught in each mesh size of the gill nets set in the central main basin near Southampton in the fall during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Burbot						1						1	1.00
Chinook Salmon	2	8	14	1	2			1				28	7.00
Chub	50	2			1	1						54	2.00
Cisco		1		2	2							5	1.67
Lake Trout		1		5	7	13	15	2	5	1	3	52	2.36
Lake Whitefish		13	1	1	1	1	6	7	9	1	2	42	1.61
Longnose Sucker		1		1	2	4	1	1	1			11	1.10
Rainbow Smelt					1							1	1.00
Round Goby			1									1	1.00
Round Whitefish		1	3	6	1							11	1.57
Smallmouth Bass									1			1	1.00
White Sucker	1		9	4	6	8	3		1			32	6.40
Yellow Perch	7	39	23									69	11.50
Total	60	66	51	20	23	28	25	11	17	2	5	308	

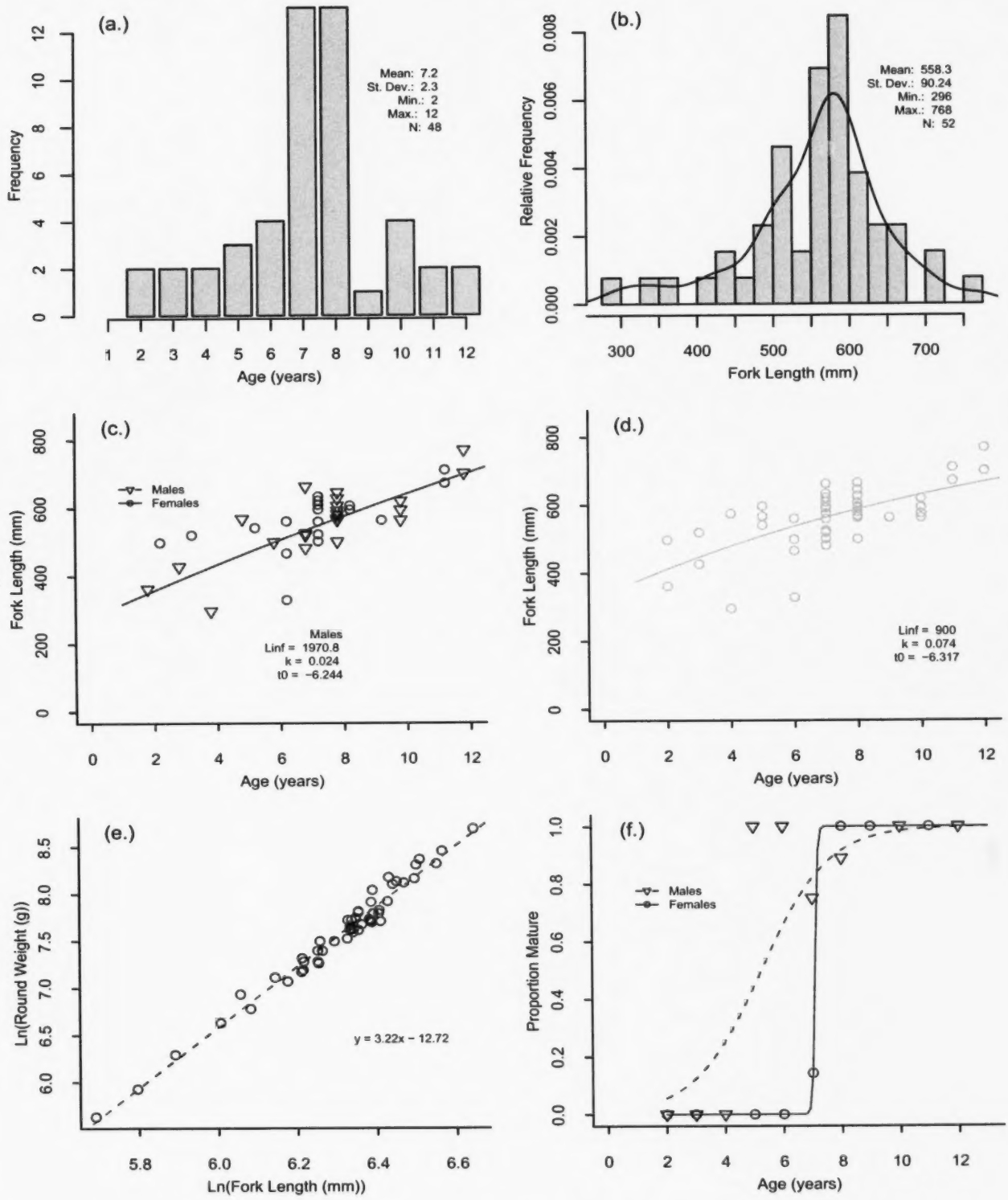

Figure 16. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Southampton project (LHA_IA09_005), September 2009.

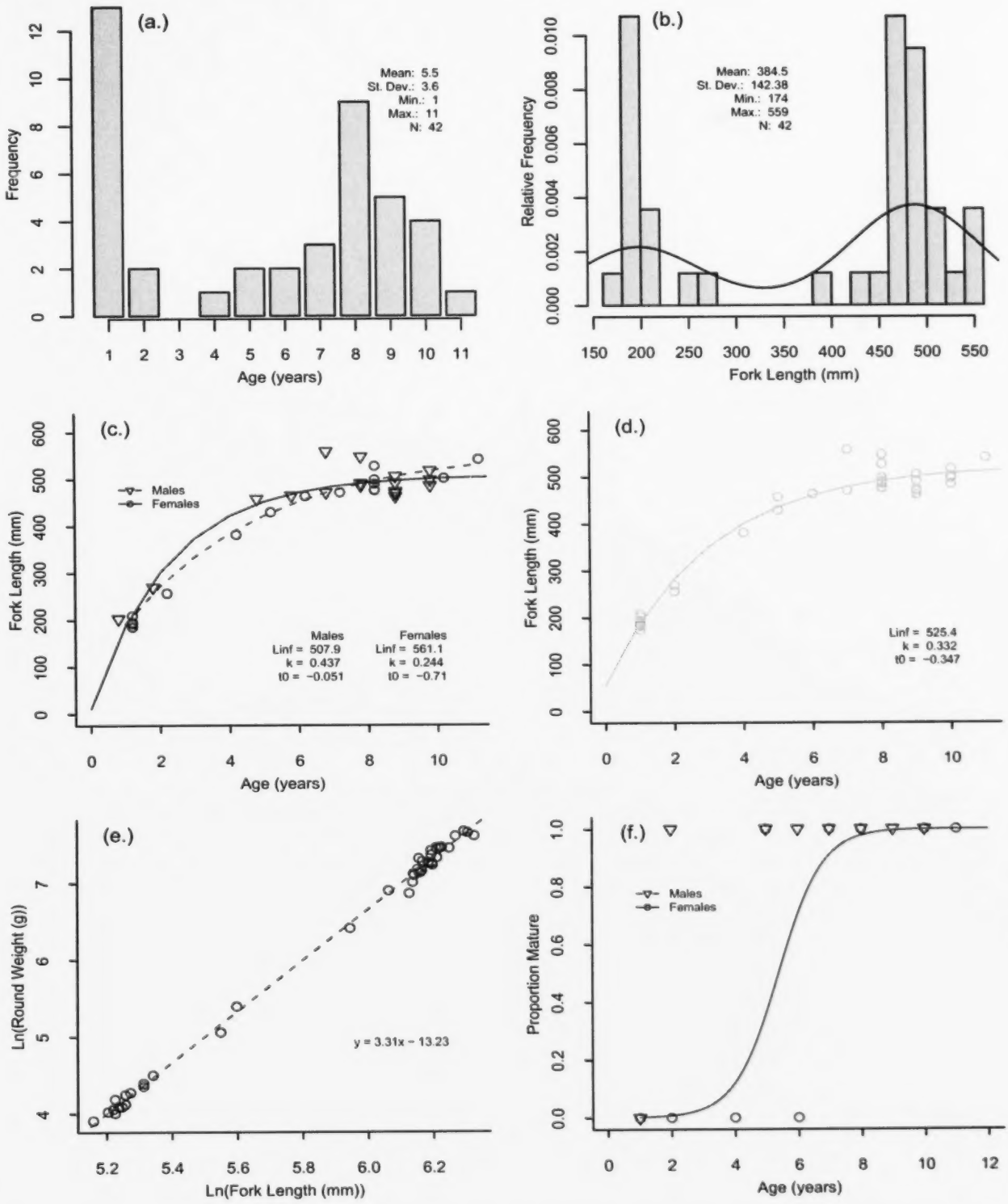

Figure 17. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Southampton project (LHA_IA09_005), September 2009.

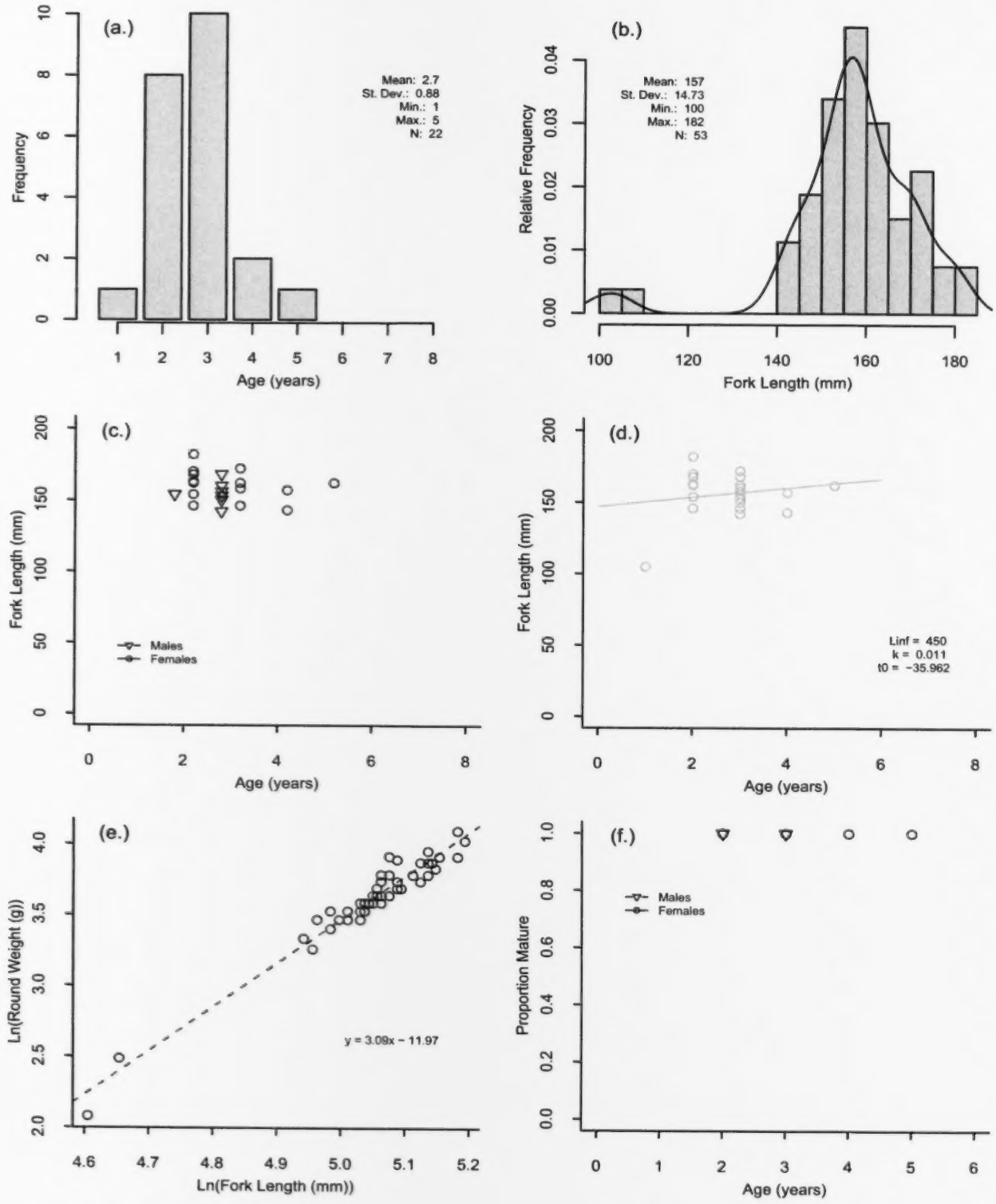

Figure 18. Chub age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Southampton project (LHA_IA09_005), September 2009.

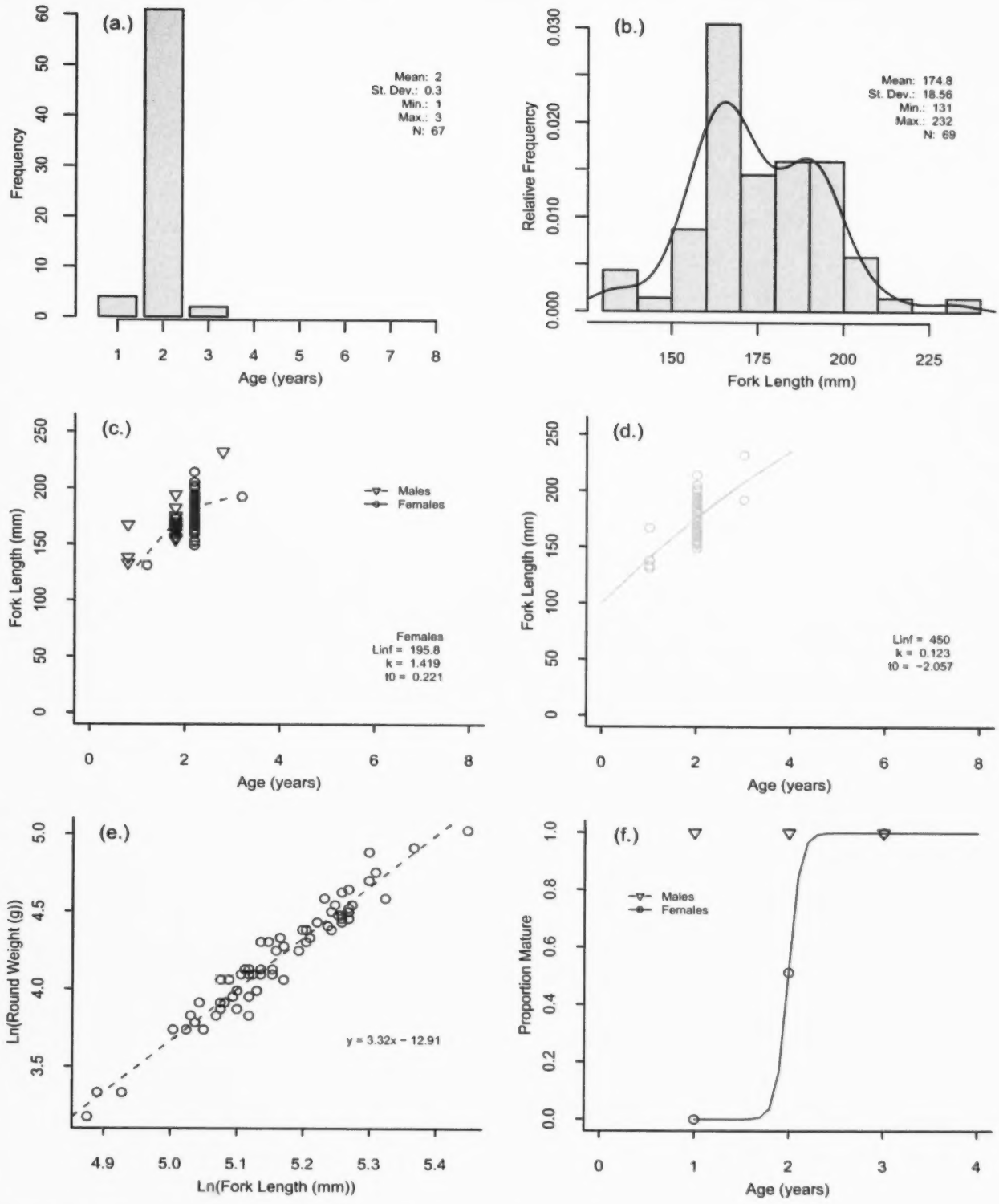

Figure 19. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Southampton project (LHA_IA09_005), September 2009.

Central Lake Huron (Stokes Bay) **[LHA_IA09_026]**

This project was conducted in the central main basin near Stokes Bay between June 01 and June 18 (Table 9). This project was run to evaluate the progress towards lake trout rehabilitation in the area. The depth of the nets ranged between 16.5 m and 70.1 m and encompassed three depth strata: <25 m, 30-50 m, and >60 m. All 27 net sets were approximately 24 hours in duration. Only lake trout were targeted. The position of each net is shown in Figure 20.

Ten fish species were caught during this project (Table 10). The most common species were lake whitefish (37.1 % of the catch), cisco (28.1 %), and lake trout (18.3 %). Plots of the biological attributes of the lake trout (Figure 21), lake whitefish (Figure 22), and cisco (Figure 23) captured during this project were constructed.

Average CPUE for this project was 8.3 fish/night. Cisco had the highest mean CPUE (12.6), followed by lake whitefish (4.6), and white sucker (3.0). Lake trout were caught in all but the two smallest (32 mm and 38 mm) mesh sizes.

Table 9. Set information for the fishing gear deployed in the central main basin near Stokes Bay during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
2601	01-Jun-09	44° 46.16'	-81° 21.79'	GL32	25.11	22.2
2602	01-Jun-09	44° 43.51'	-81° 30.64'	GL32	22.75	69.2
2603	01-Jun-09	44° 44.88'	-81° 26.09'	GL21	23.96	37.8
2604	02-Jun-09	44° 53.86'	-81° 26.77'	GL32	18.36	26.4
2605	02-Jun-09	44° 52.68'	-81° 30.71'	GL32	19.31	35.4
2606	02-Jun-09	44° 51.91'	-81° 33.18'	GL21	20.16	70.1
2607	03-Jun-09	44° 55.24'	-81° 36.27'	GL32	23.25	67.8
2608	03-Jun-09	44° 56.43'	-81° 31.40'	GL32	22.08	38.9
2609	03-Jun-09	44° 57.25'	-81° 28.28'	GL21	21.13	24.5
2610	04-Jun-09	45° 00.84'	-81° 41.41'	GL32	23.18	59.0
2611	04-Jun-09	45° 03.80'	-81° 30.89'	GL32	20.54	16.5
2612	04-Jun-09	45° 02.64'	-81° 34.86'	GL21	21.53	39.9
2613	08-Jun-09	44° 49.39'	-81° 27.31'	GL32	23.04	37.1
2614	08-Jun-09	44° 48.29'	-81° 31.45'	GL32	23.23	63.7
2615	08-Jun-09	44° 50.24'	-81° 24.01'	GL21	22.85	20.9
2616	09-Jun-09	44° 56.29'	-81° 28.60'	GL32	20.65	26.1
2617	09-Jun-09	44° 55.25'	-81° 32.45'	GL32	21.71	44.8
2618	09-Jun-09	44° 54.55'	-81° 35.09'	GL21	22.48	65.5
2619	10-Jun-09	44° 58.82'	-81° 32.41'	GL32	20.83	41.9
2620	10-Jun-09	44° 57.47'	-81° 37.58'	GL32	22.00	57.6
2621	10-Jun-09	44° 59.60'	-81° 29.42'	GL21	19.88	15.6
2622	11-Jun-09	44° 46.57'	-81° 31.04'	GL32	23.00	66.8
2623	11-Jun-09	44° 48.41'	-81° 23.84'	GL32	20.96	23.9
2624	11-Jun-09	44° 47.54'	-81° 27.27'	GL21	21.90	39.2
2625	17-Jun-09	44° 41.69'	-81° 19.72'	GL32	24.21	18.2
2626	17-Jun-09	44° 41.69'	-81° 26.44'	GL32	22.80	42.8
2627	17-Jun-09	44° 41.68'	-81° 29.58'	GL21	21.56	64.8

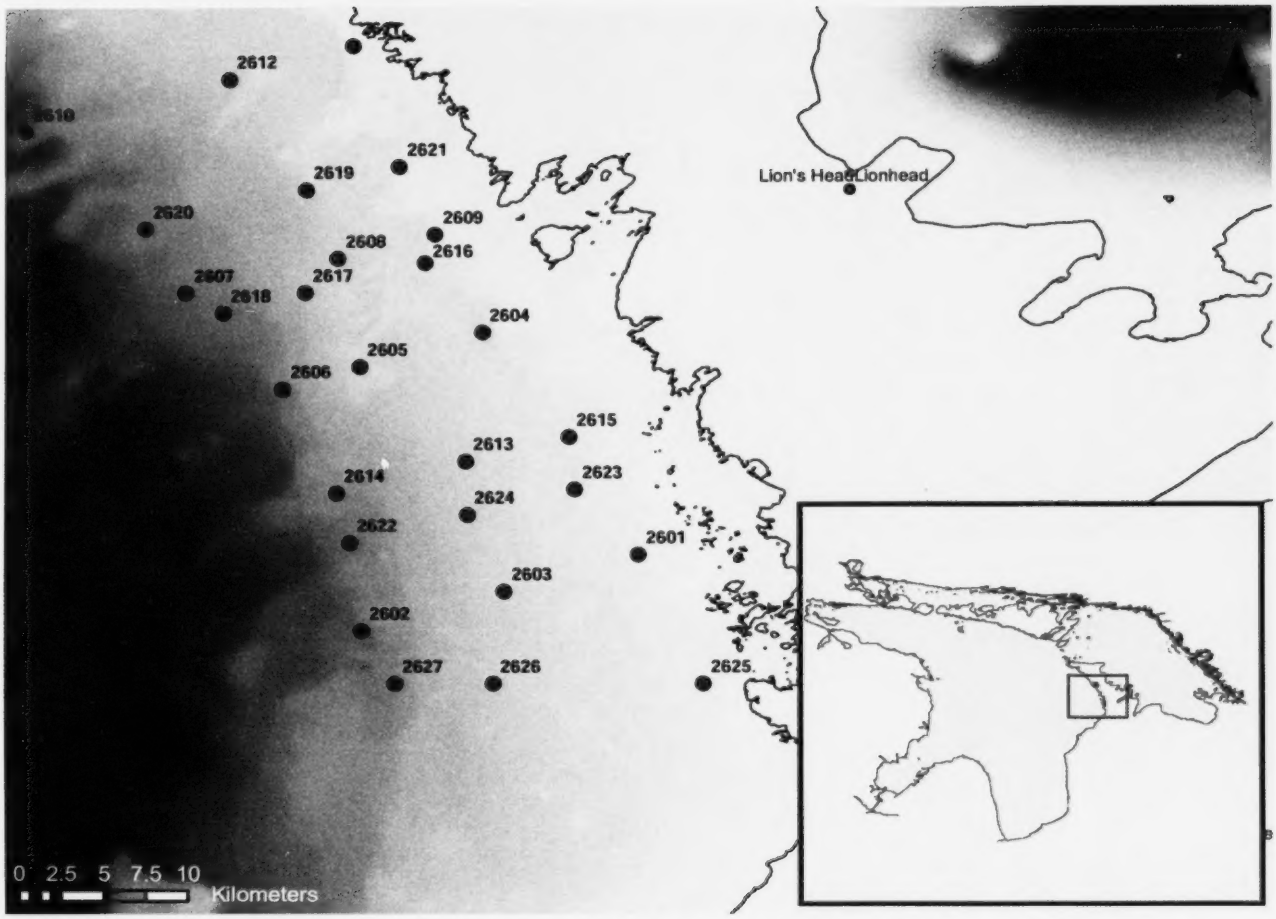

Figure 20. Offshore index sampling locations in the central main basin near Stokes Bay during 2009 (project code LHA_IA09_026). Lake trout were targeted.

Table 10. Count of the number of fish by species caught in each mesh size of the gill nets set in the central main basin near Stokes Bay during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Alewife	1											1	1.00
Burbot		1		1	3	2	3	2				12	2.00
Chub	7											7	1.75
Cisco			5	29	17	12						63	12.60
Lake Trout			5	6	7	5	5	4	7	1	1	41	1.52
Lake Whitefish				3	15	11	17	31	4	2		83	4.61
Round Goby	3	2										5	2.50
Round Whitefish			1									1	1.00
White Sucker			5	2	2							9	3.00
Yellow Perch	1		1									2	1.00
Total	12	3	17	41	44	30	25	37	11	3	1	224	

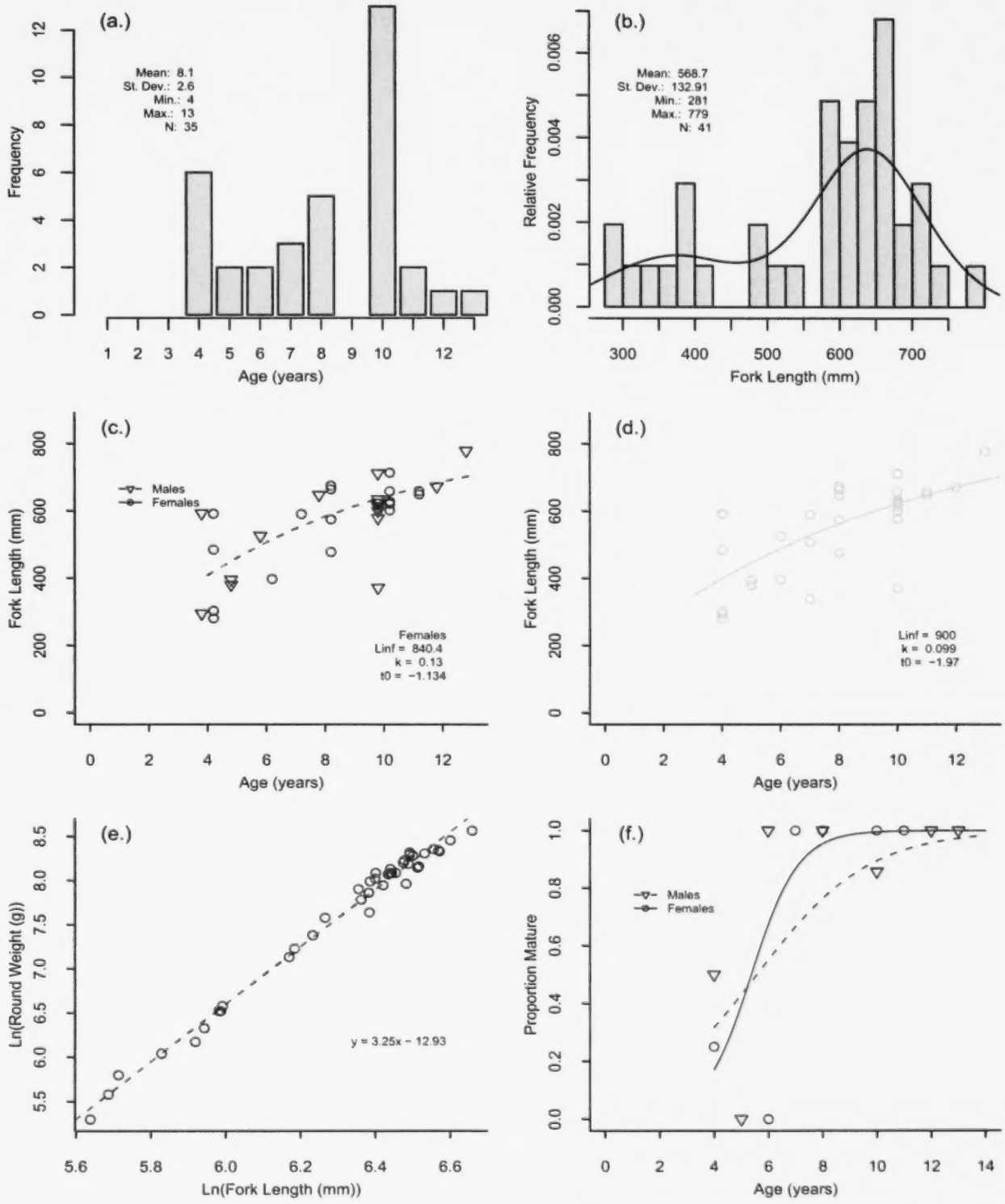

Figure 21. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Stokes Bay project (LHA_IA09_026).

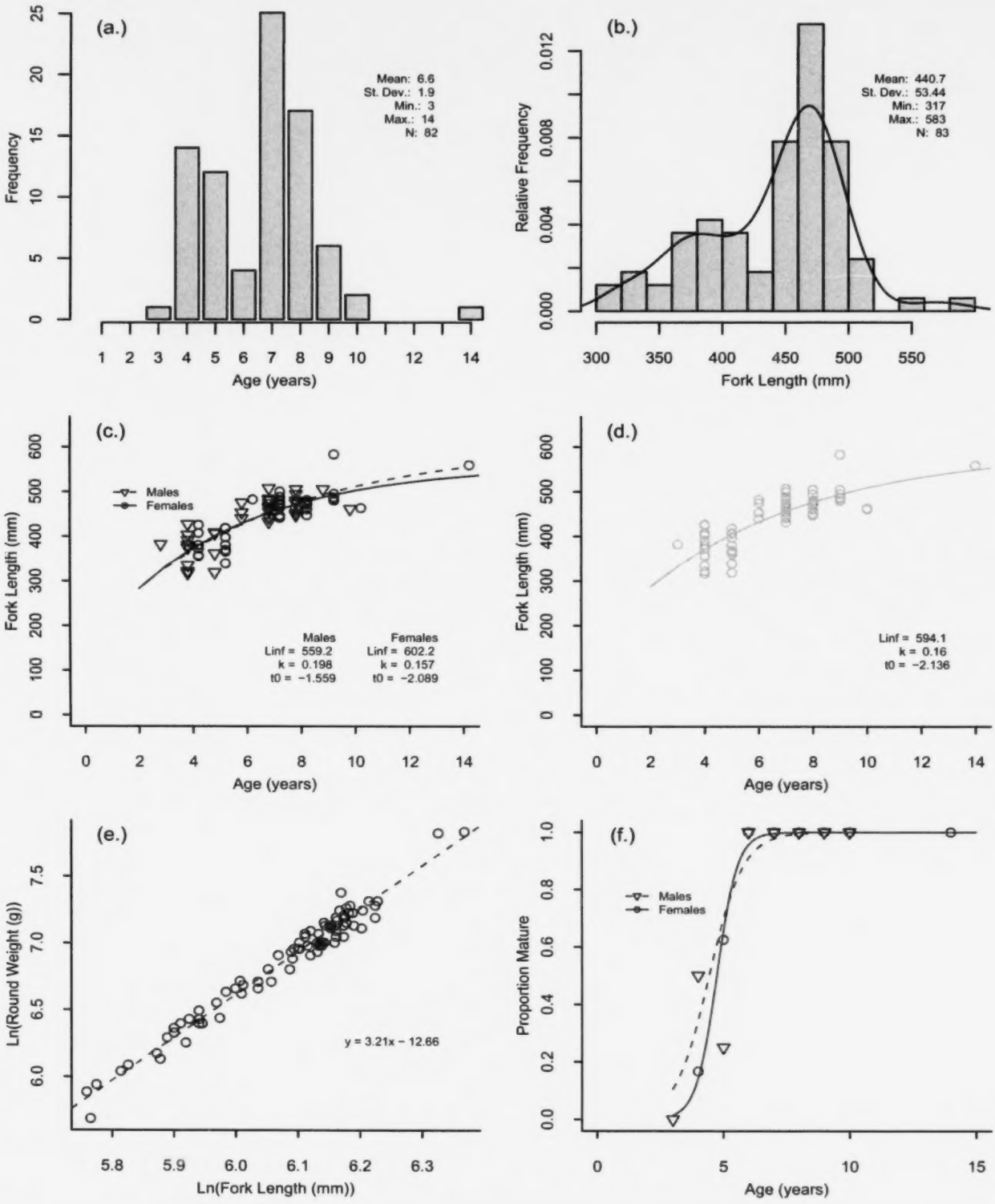

Figure 22. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Stokes Bay project (LHA_IA09_026).

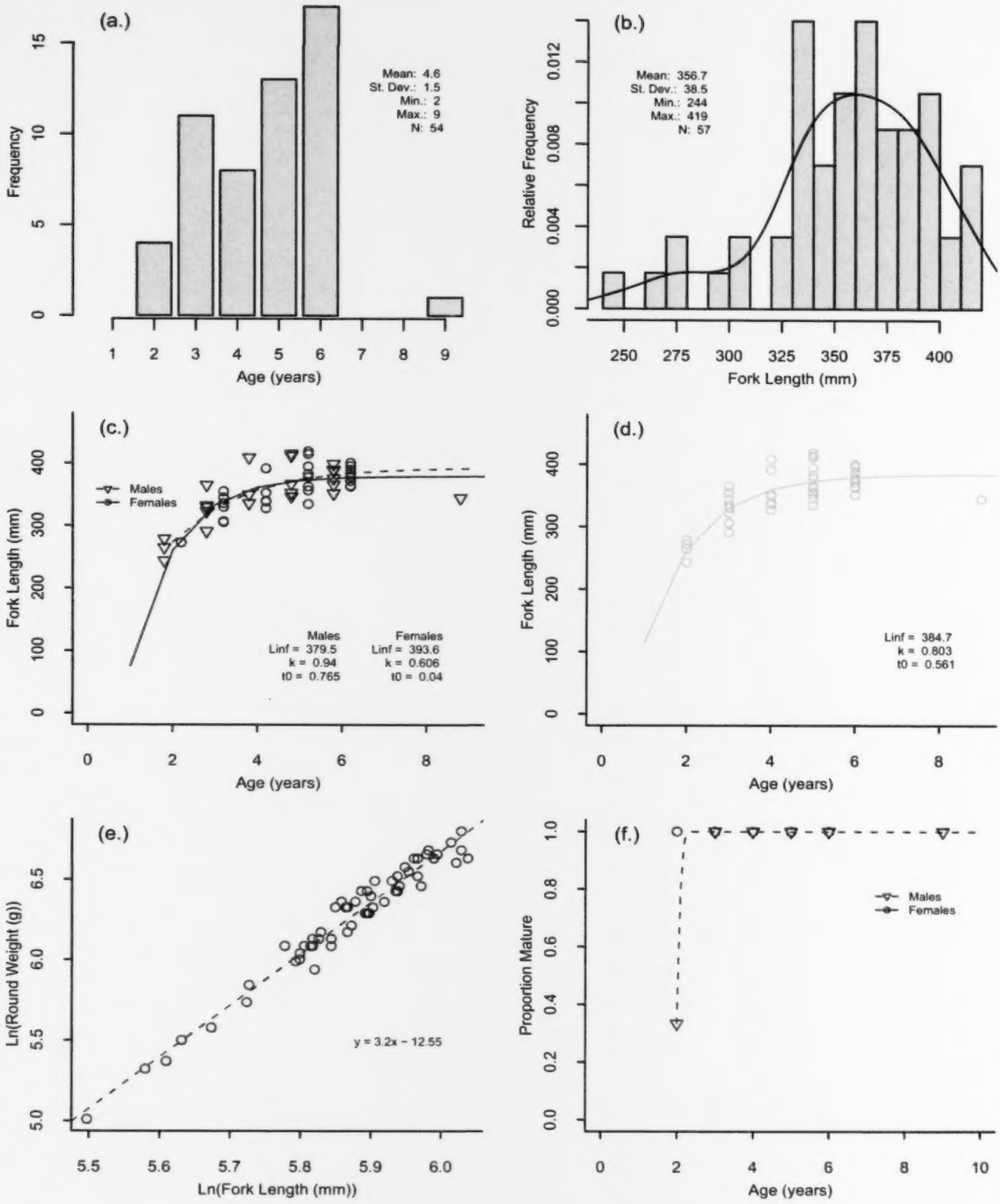

Figure 23. Cisco age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Stokes Bay project (LHA_IA09_026).

Southern Lake Huron (Grand Bend) - Spring [LHA_IA09_006]

This project was conducted in the southern main basin near Grand Bend between June 19 and July 03 (Table 11). The depth of the nets ranged between 9.1 m and 78.5 m. Three of the 30 nets fished for more than one night due to inclement weather creating unsafe work conditions. Lake whitefish, chub, and yellow perch were sought. The position of each net is shown in Figure 24.

Twelve fish species were caught during this project (Table 12). The most common species were yellow perch (52.5 % of the catch), lake whitefish (28.5 %), and chub (5.9 %). Plots of the biological attributes of the lake trout (Figure 25), lake whitefish (Figure 26), chub (Figure 27), yellow perch (Figure 28), and walleye (Figure 29) captured during this project were constructed.

Average CPUE for this project was 35.8 fish/night, one-third of the average CPUE observed last year and below the long-term average. Yellow perch had the highest mean CPUE (41.1), followed by lake whitefish (23.2), and white sucker (6.1). More than half of the yellow perch were caught in the 32 mm mesh.

Table 11. Set information for the fishing gear deployed in the spring in the southern main basin near Grand Bend during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
601	19-Jun-09	43° 38.30'	-82° 00.69'	GL32	18.71	78.5
602	19-Jun-09	43° 37.91'	-82° 01.15'	GL32	18.06	77.8
603	19-Jun-09	43° 36.72'	-81° 54.82'	GL21	16.41	53.6
604	20-Jun-09	43° 38.11'	-81° 57.38'	GL32	22.80	70.5
605	20-Jun-09	43° 37.68'	-81° 57.90'	GL32	22.08	70.8
606	20-Jun-09	43° 37.31'	-81° 56.18'	GL21	21.15	62.6
607	21-Jun-09	43° 38.02'	-81° 54.15'	GL32	22.66	53.3
608	21-Jun-09	43° 37.49'	-81° 54.73'	GL32	21.91	54.7
609	21-Jun-09	43° 36.68'	-81° 53.23'	GL21	20.98	42.3
610	22-Jun-09	43° 32.93'	-81° 53.17'	GL32	21.61	37.3
611	22-Jun-09	43° 32.45'	-81° 53.63'	GL32	21.76	37.3
612	22-Jun-09	43° 32.28'	-81° 52.91'	GL21	21.83	32.7
613	23-Jun-09	43° 18.86'	-81° 53.09'	GL32	24.20	18.7
614	23-Jun-09	43° 19.09'	-81° 52.38'	GL32	24.11	18.5
615	23-Jun-09	43° 18.21'	-81° 52.18'	GL21	24.33	17.2
616	24-Jun-09	43° 16.96'	-81° 51.65'	GL32	21.86	13.1
617	24-Jun-09	43° 16.49'	-81° 52.04'	GL32	21.23	13.0
618	24-Jun-09	43° 16.11'	-81° 51.90'	GL21	20.45	9.1
619	25-Jun-09	43° 34.11'	-81° 48.22'	GL32	17.96	19.2
620	25-Jun-09	43° 33.42'	-81° 47.88'	GL32	18.14	19.3
621	25-Jun-09	43° 33.46'	-81° 46.72'	GL21	18.31	16.0
622	29-Jun-09	43° 18.25'	-81° 58.08'	GL32	20.30	26.2
623	29-Jun-09	43° 18.24'	-81° 58.86'	GL32	19.70	26.6
624	29-Jun-09	43° 17.71'	-81° 57.92'	GL21	19.03	23.5
625	30-Jun-09	43° 23.52'	-81° 56.98'	GL32	50.43	33.5
626	30-Jun-09	43° 24.13'	-81° 57.09'	GL32	49.60	34.1
627	30-Jun-09	43° 23.81'	-81° 56.40'	GL21	48.90	31.4
628	02-Jul-09	43° 32.66'	-81° 44.52'	GL32	15.36	12.2
629	02-Jul-09	43° 33.39'	-81° 44.81'	GL32	15.23	12.6
630	02-Jul-09	43° 33.40'	-81° 45.54'	GL21	15.81	12.9

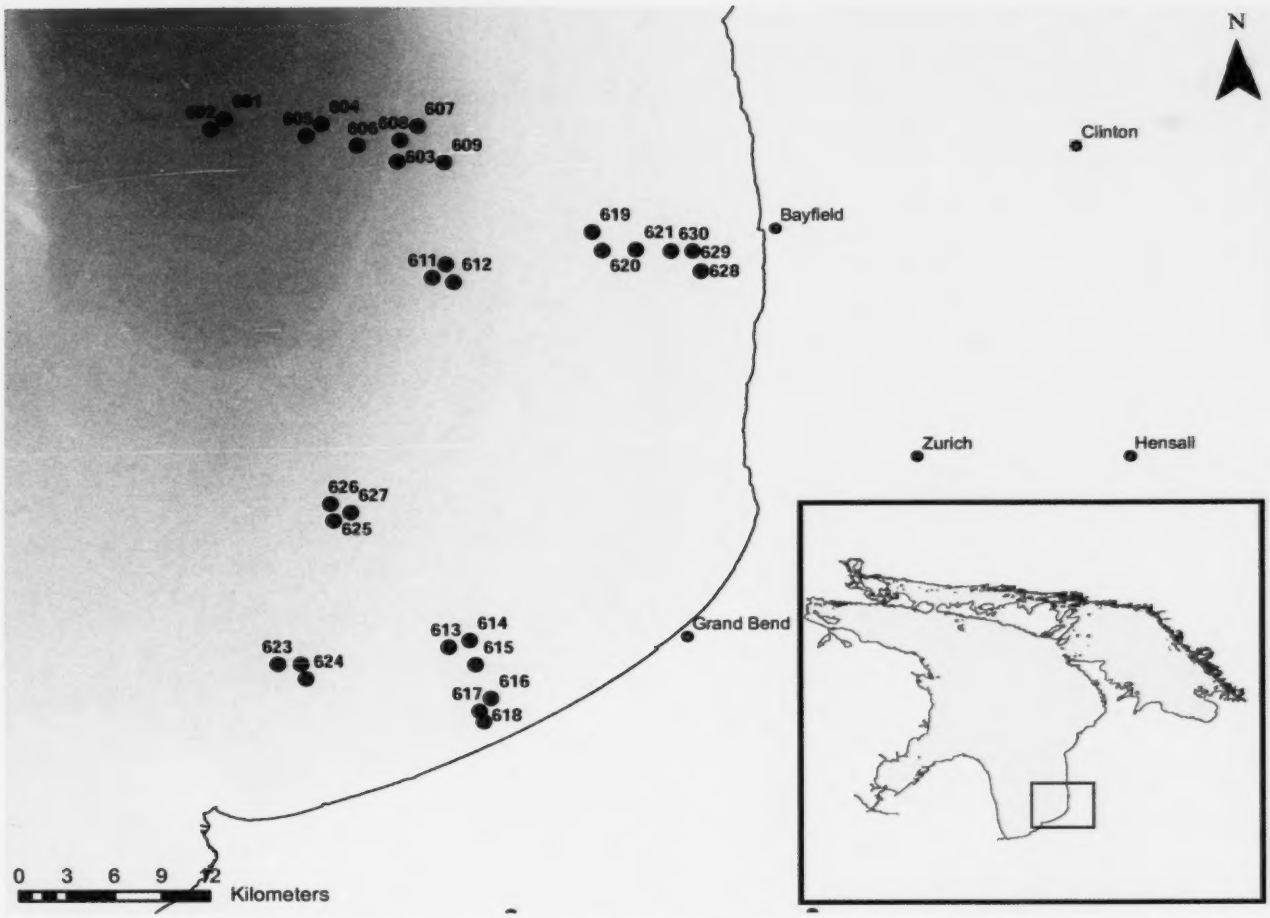

Figure 24. Offshore index sampling locations in the southern main basin near Grand Bend during 2009 (project code LHA_IA09_006) during the spring (June and July). Chub, lake whitefish, and yellow perch were targeted.

Table 12. Count of the number of fish by species caught in each mesh size of the gill nets set in the southern main basin near Grand Bend in the spring during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Chub	33	22	10	1								66	2.00
Cisco	4											4	4.00
Coho Salmon						1						1	1.00
Lake Trout			2	3	5	6	9	4	7	2	2	40	1.89
Lake Whitefish		10	47	75	73	68	16	14	11	3	1	318	23.43
Longnose Sucker			1	3	9	6	3	2				24	4.00
Rainbow Smelt	1		2	1				1				5	1.67
Rock Bass			1									1	1.00
Round Goby	1											1	1.00
Walleye				1	2	6	12	4	3			28	2.26
White Sucker				3	3	18	16	3				43	6.14
Yellow Perch	307	56	123	54	33	7	6					586	41.08
Total	346	88	186	141	125	112	62	28	21	5	3	1117	

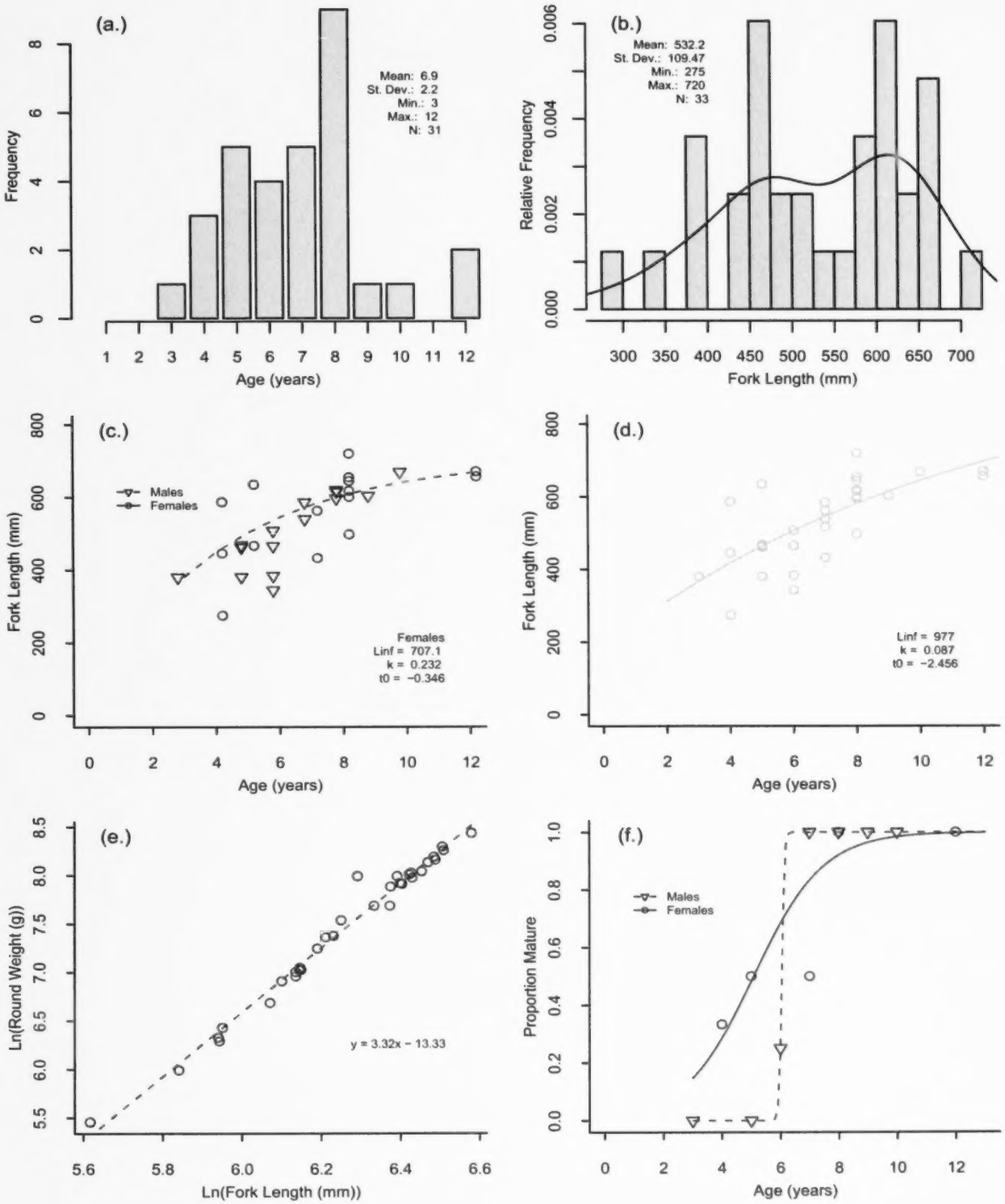

Figure 25. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), June 2009.

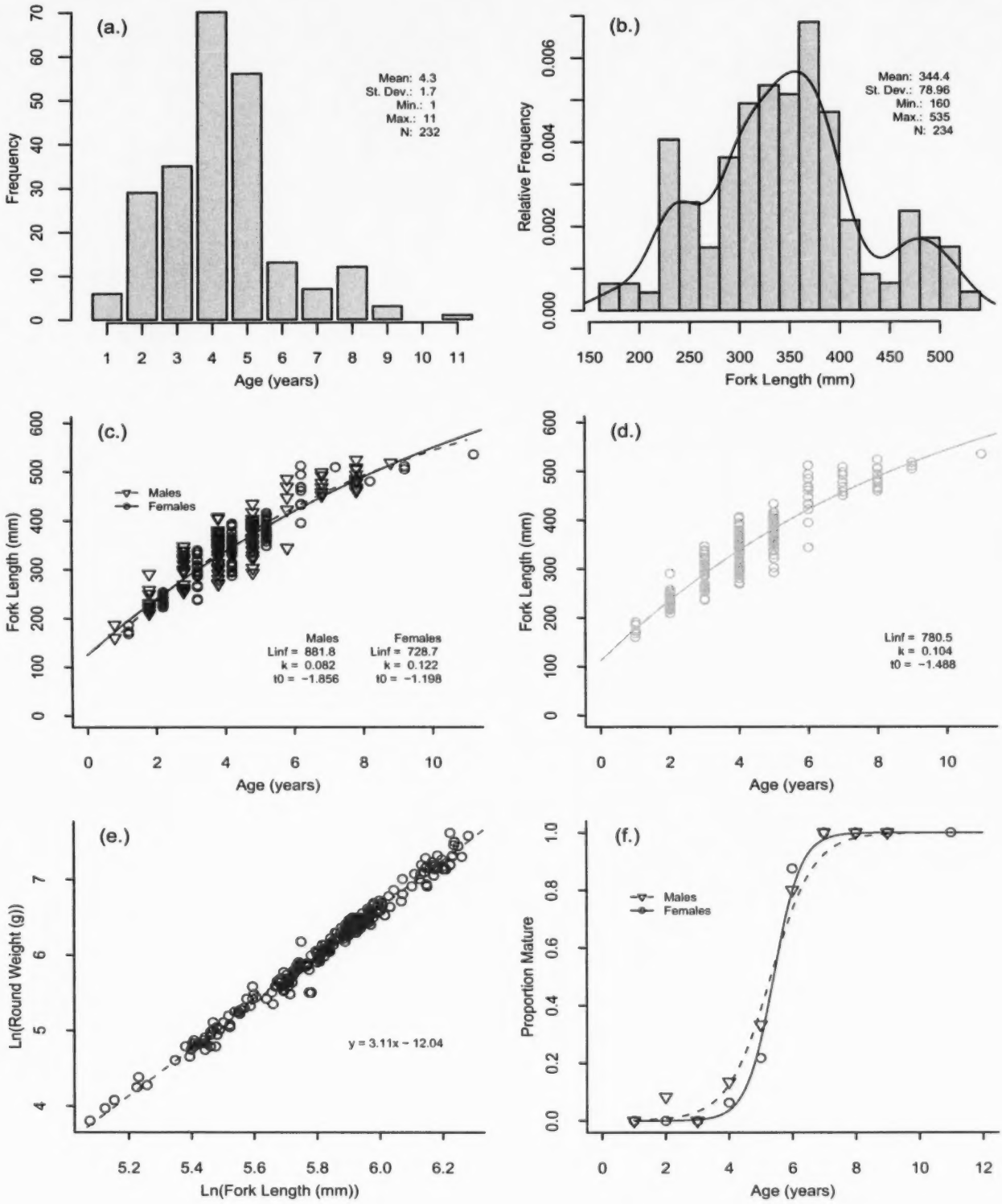

Figure 26. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), June 2009.

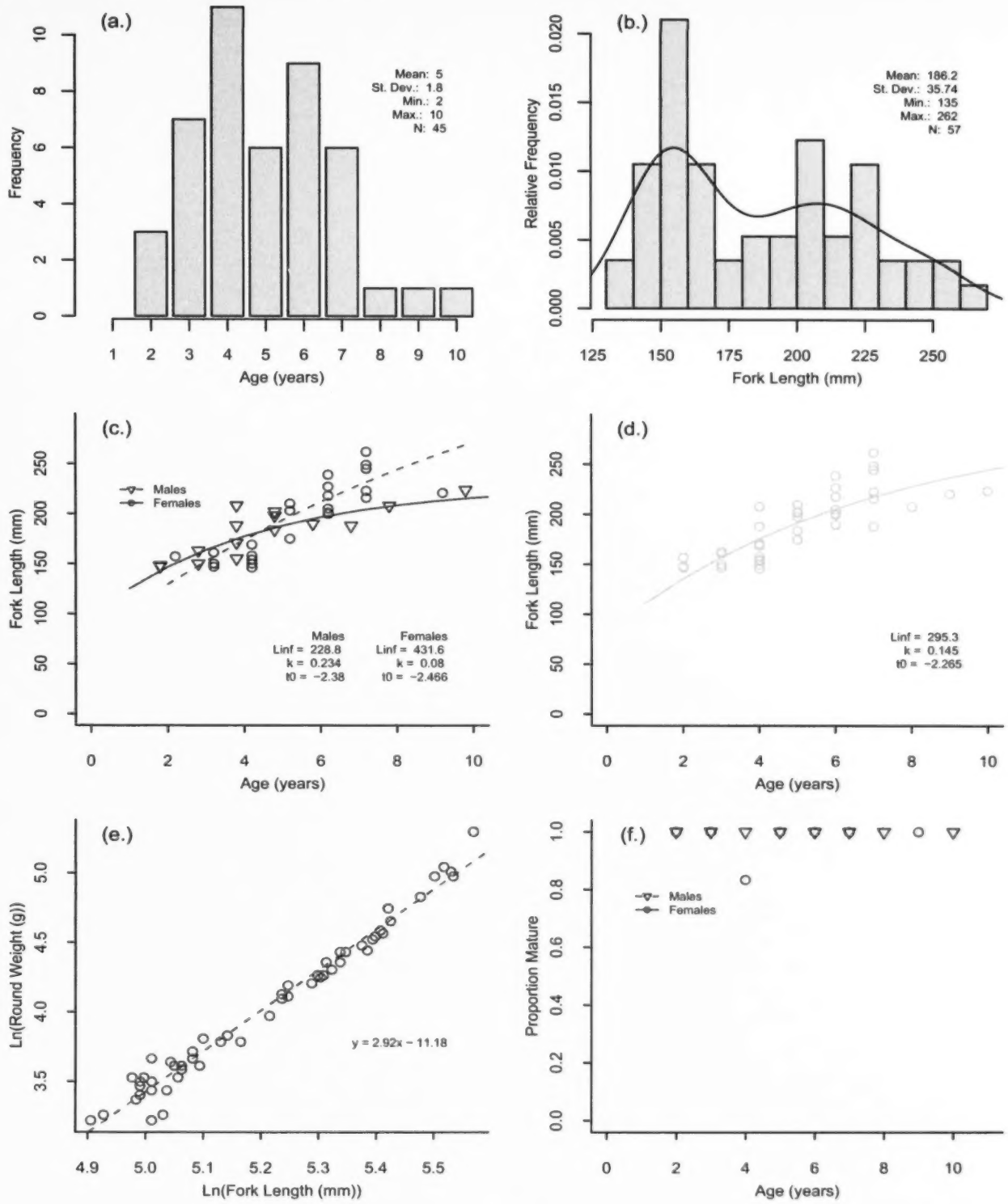

Figure 27. Chub age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), June 2009.

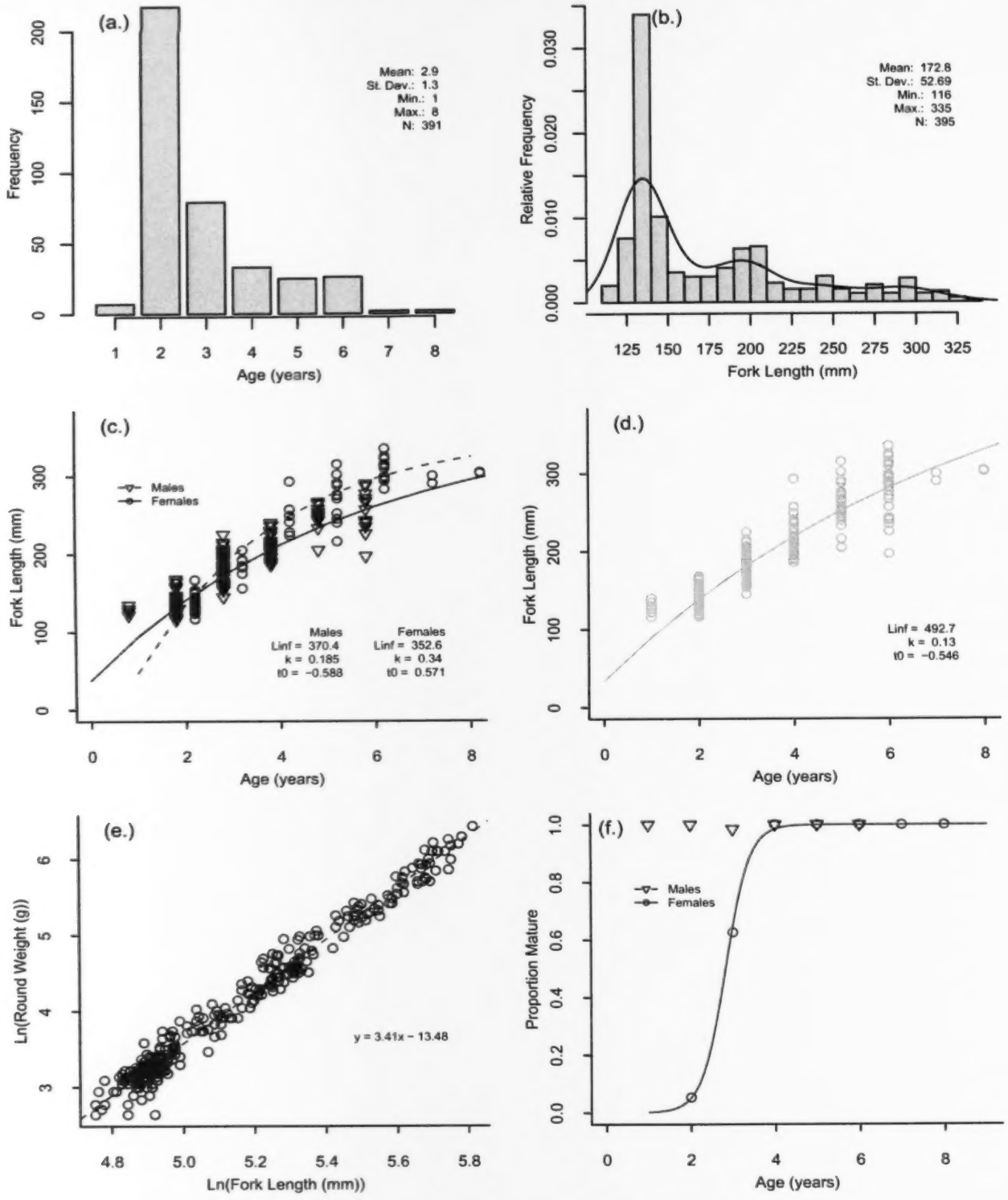

Figure 28. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), June 2009.

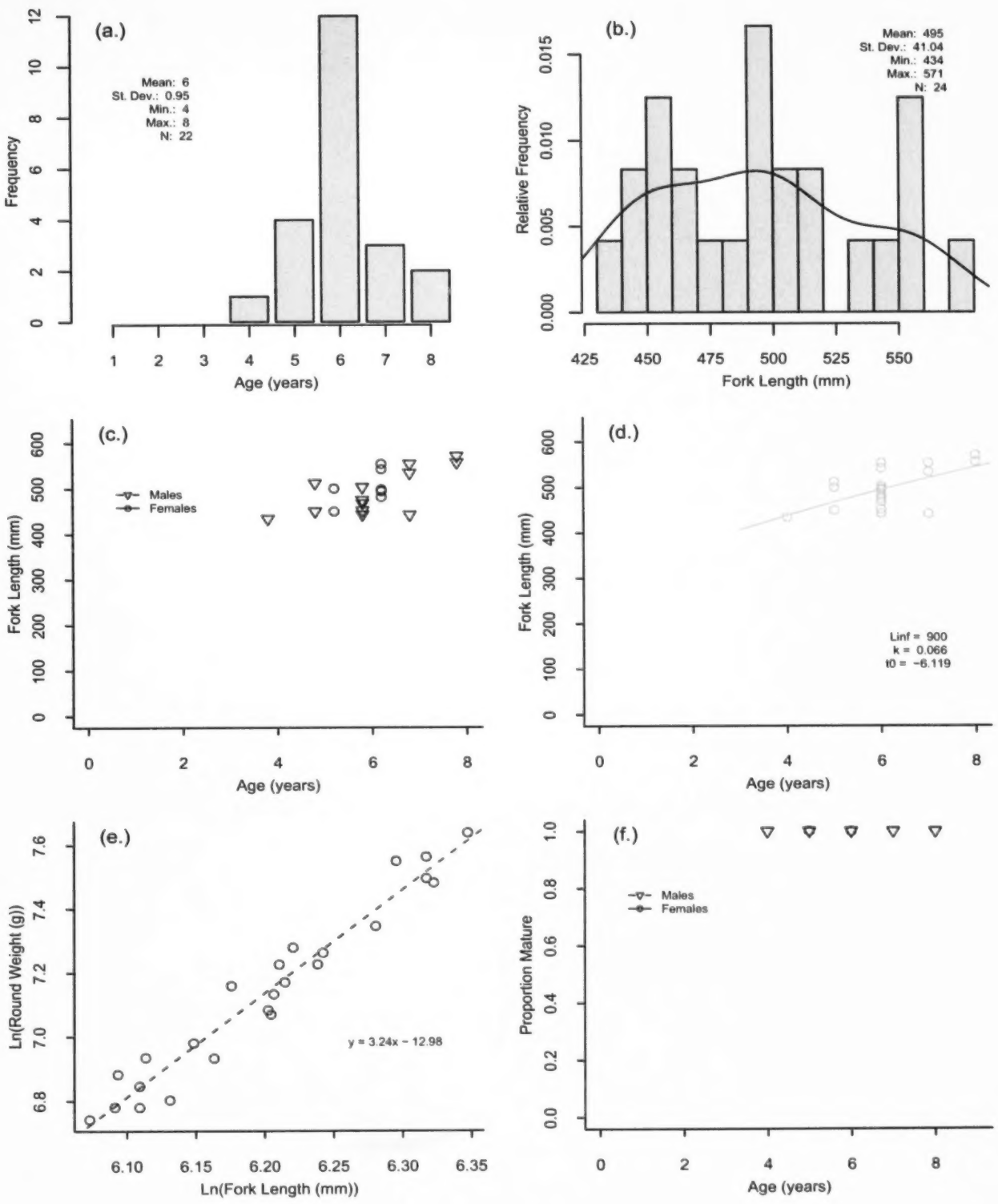

Figure 29. Walleye age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), June 2009.

Southern Lake Huron (Grand Bend) - Fall **[LHA_IA09_006]**

This project was conducted in the southern main basin near Grand Bend between October 01 and October 08 (Table 13). The depth of the nets ranged between 19.4 m and 36.7 m. Three of the 6 nets fished for more than one night due to inclement weather creating unsafe work conditions. Lake whitefish and yellow perch were targeted. The position of each net is shown in Figure 30.

Thirteen fish species were caught during this project (Table 14). Five more species were caught last year, likely because 21 more nets were set last year. The species caught with the highest frequency was yellow perch (80.5 % of the catch). The other two most frequently caught species were lake whitefish (7.0 %) and white sucker (4.6 %). Plots of the biological attributes of the lake whitefish (Figure 31) and yellow perch (Figure 32) captured during this project were constructed.

Average CPUE for this project was 155.8 fish/night. Yellow perch had the highest mean CPUE (73.0), followed by lake whitefish (18.3), and white sucker (17.3). All of the chub and over 50 % of the yellow perch were caught in the 32 mm and 38 mm mesh sizes.

Table 13. Set information for the fishing gear deployed in the fall in the southern main basin near Grand Bend during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
651	01-Oct-09	43° 34.24'	-81° 49.14'	GL32	16.55	20.4
652	01-Oct-09	43° 33.29'	-81° 48.85'	GL32	16.79	20.0
653	01-Oct-09	43° 33.25'	-81° 47.53'	GL21	17.04	19.4
654	06-Oct-09	43° 34.16'	-81° 53.10'	GL32	48.33	36.7
655	06-Oct-09	43° 33.53'	-81° 52.84'	GL32	47.68	35.8
656	06-Oct-09	43° 33.51'	-81° 52.41'	GL21	46.98	31.2

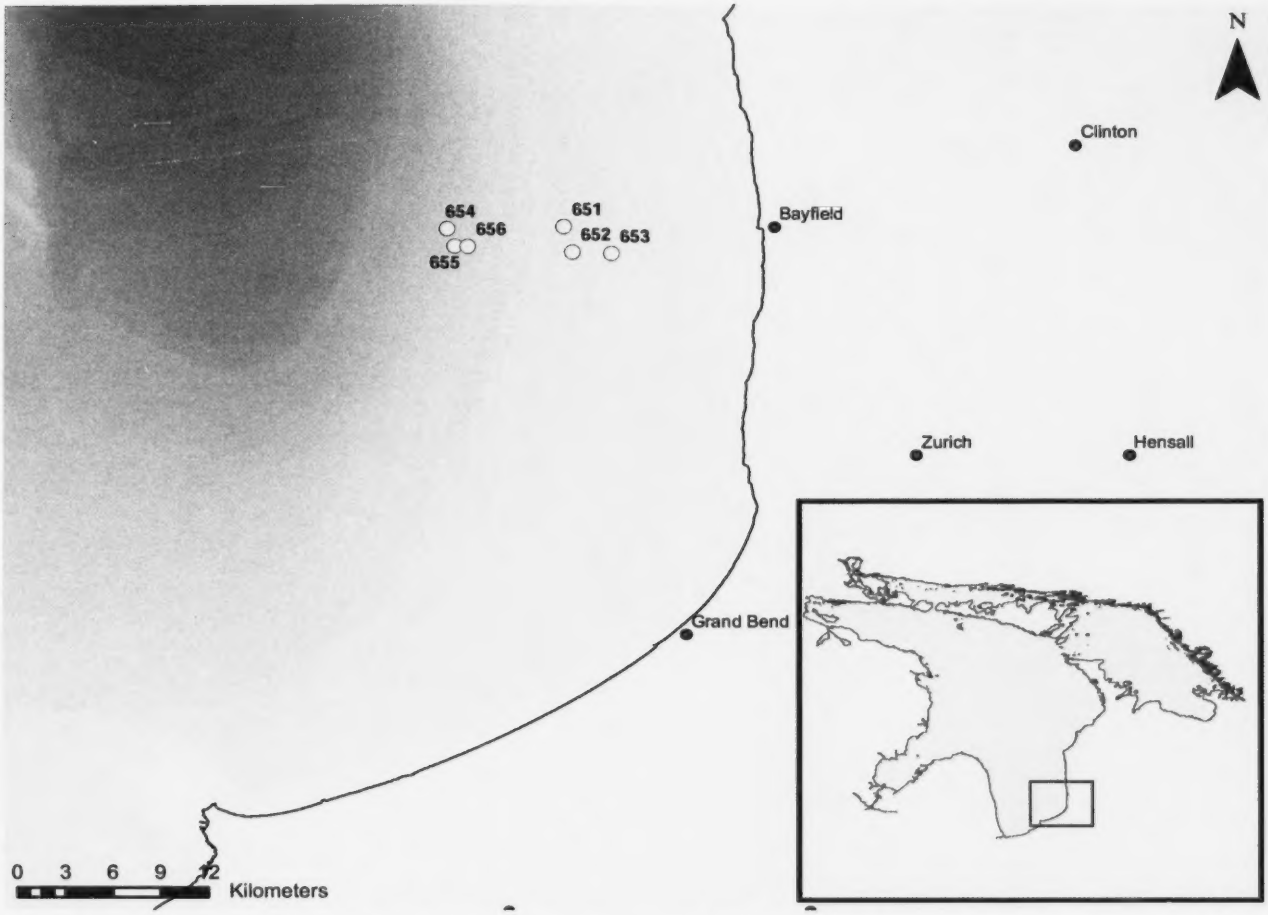

Figure 30. Offshore index sampling locations in the southern main basin near Grand Bend during 2009 (project code LHA_IA09_006) during the fall (October). Lake whitefish and yellow perch were targeted.

Table 14. Count of the number of fish by species caught in each mesh size of the gill nets set in the southern main basin near Grand Bend in the fall during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Channel Catfish									1	1		2	2.00
Chub	15	8										23	5.48
Cisco			1									1	0.71
Gizzard Shad						1	2	2	3	3	3	14	2.92
Lake Trout					3	1	4	1	2			11	2.62
Lake Whitefish		10	16	8	33	8	4					79	18.33
Longnose Sucker				1	2							3	1.25
Rainbow Smelt	2	2	4	4	3	1						16	2.58
Round Goby	4											4	1.67
Walleye				1		4	4	3	1			13	2.10
White Bass			1									1	0.71
White Sucker		1	1	6	10	23	11					52	17.33
Yellow Perch	296	222	163	104	79	23	5	7	2	1	1	903	73.00
Total	317	243	186	124	130	61	30	13	9	5	4	1122	

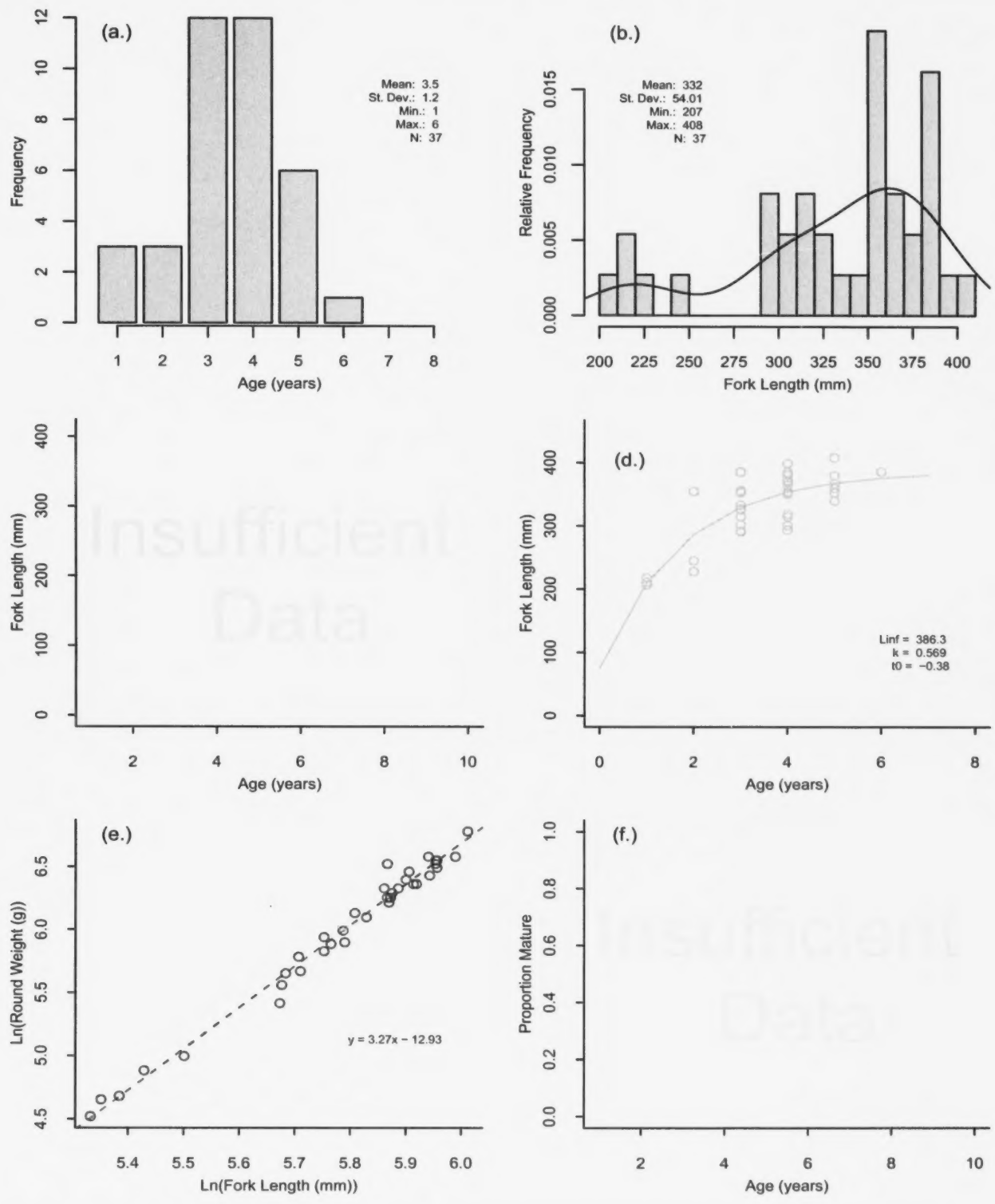

Figure 31. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), October 2009.

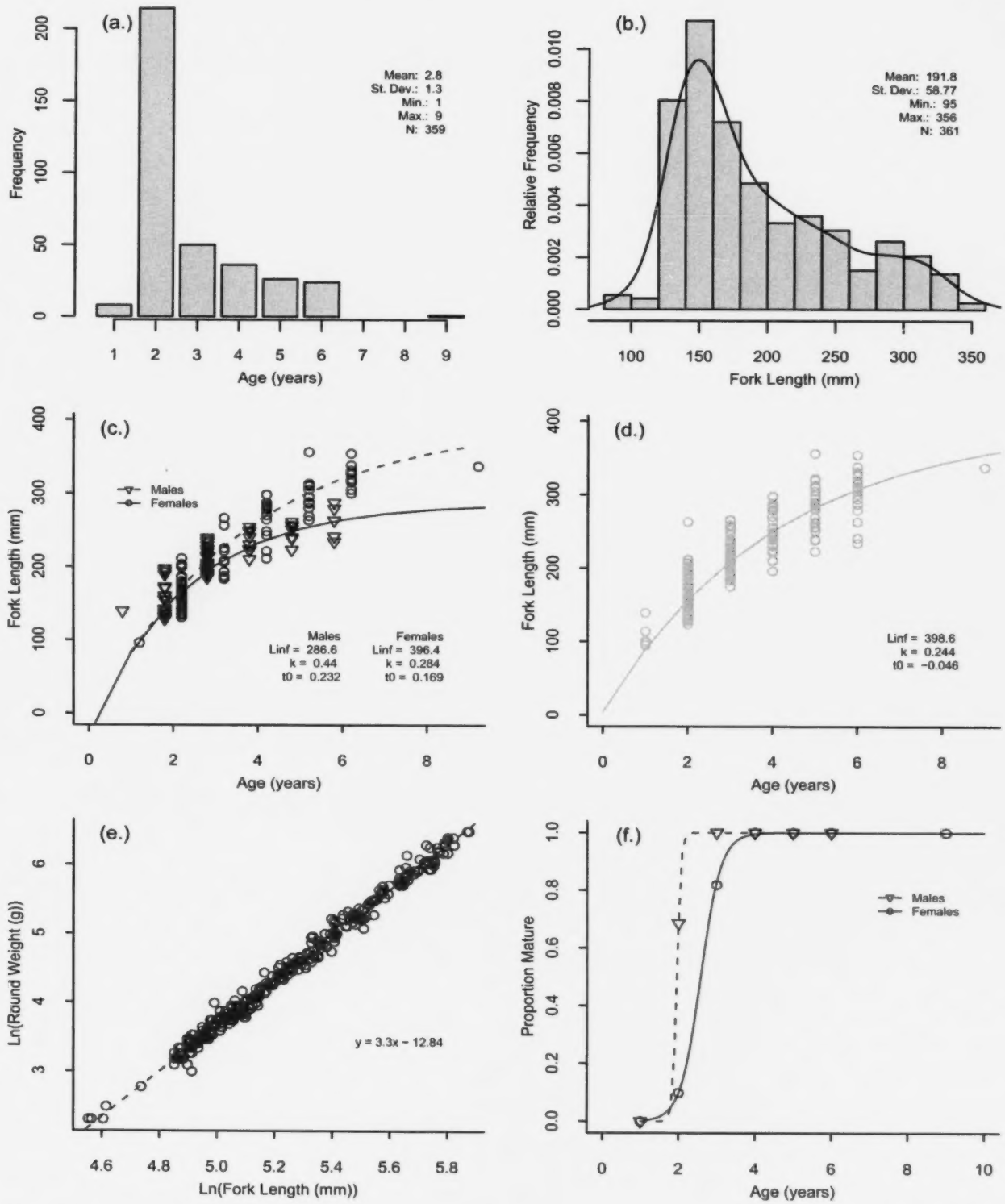

Figure 32. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Grand Bend project (LHA_IA09_006), October 2009.

North Channel (Clapperton Island) **[LHA_IA09_007]**

This project was conducted in the North Channel near Clapperton Island between July 09 and July 15 (Table 15). The depth of the nets ranged between 9.4 m and 42.5 m. Nets set in water less than 15 m deep were set at historical sites to target yellow perch. Nets set in water greater than 15 m deep were set at random sites to target lake trout and lake whitefish. Lake trout were targeted to evaluate the progress towards lake trout rehabilitation in the area. All 18 net sets were approximately 24 hours in duration. The position of each net is shown in Figure 33.

Fifteen fish species were caught during this project (Table 16). The most common species were yellow perch (54.7 % of the catch), white sucker (18.4 %), and lake trout (6.9 %). Plots of the biological attributes of the lake trout (Figure 34), lake whitefish (Figure 35), and yellow perch (Figure 36) captured during this project were constructed.

Average CPUE for this project was 35.3 fish/night, a 75 % decrease from last year and the lowest average CPUE ever observed for this project. The low CPUE of yellow perch (38.0) was largely responsible for this decrease. The CPUE of white sucker (13.0) and chub (6.0) were the next two largest values. Nearly half of the yellow perch were caught in the 51 mm mesh size.

Table 15. Set information for the fishing gear deployed in the North Channel near Clapperton Island during the 2009 offshore index program.

Sample Number	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Average Depth (m)
701	09-Jul-09	45° 57.84'	-82° 06.58'	GL32	23.08	35.2
702	09-Jul-09	45° 58.72'	-82° 00.80'	GL32	23.91	26.7
703	09-Jul-09	45° 57.51'	-82° 06.58'	GL21	23.51	41.8
704	10-Jul-09	46° 01.55'	-82° 11.38'	GL32	24.61	10.8
705	10-Jul-09	46° 01.13'	-82° 11.52'	GL32	24.76	10.4
706	10-Jul-09	46° 00.95'	-82° 11.63'	GL21	24.90	10.2
707	11-Jul-09	45° 58.53'	-82° 16.64'	GL32	23.13	9.4
708	11-Jul-09	45° 58.05'	-82° 16.90'	GL32	22.28	9.9
709	11-Jul-09	45° 57.78'	-82° 16.77'	GL21	22.24	10.7
710	12-Jul-09	46° 03.28'	-82° 14.54'	GL32	22.38	38.2
711	12-Jul-09	46° 03.72'	-82° 14.88'	GL32	21.75	40.6
712	12-Jul-09	46° 03.59'	-82° 14.12'	GL21	21.16	30.7
713	13-Jul-09	46° 03.69'	-82° 12.28'	GL32	22.63	41.7
714	13-Jul-09	46° 03.95'	-82° 10.99'	GL32	22.10	27.4
715	13-Jul-09	46° 00.70'	-82° 09.35'	GL21	22.93	42.5
716	14-Jul-09	45° 55.75'	-82° 05.98'	GL32	21.95	12.2
717	14-Jul-09	45° 56.39'	-82° 05.60'	GL32	22.47	11.0
718	14-Jul-09	45° 55.07'	-82° 07.22'	GL21	21.54	14.1

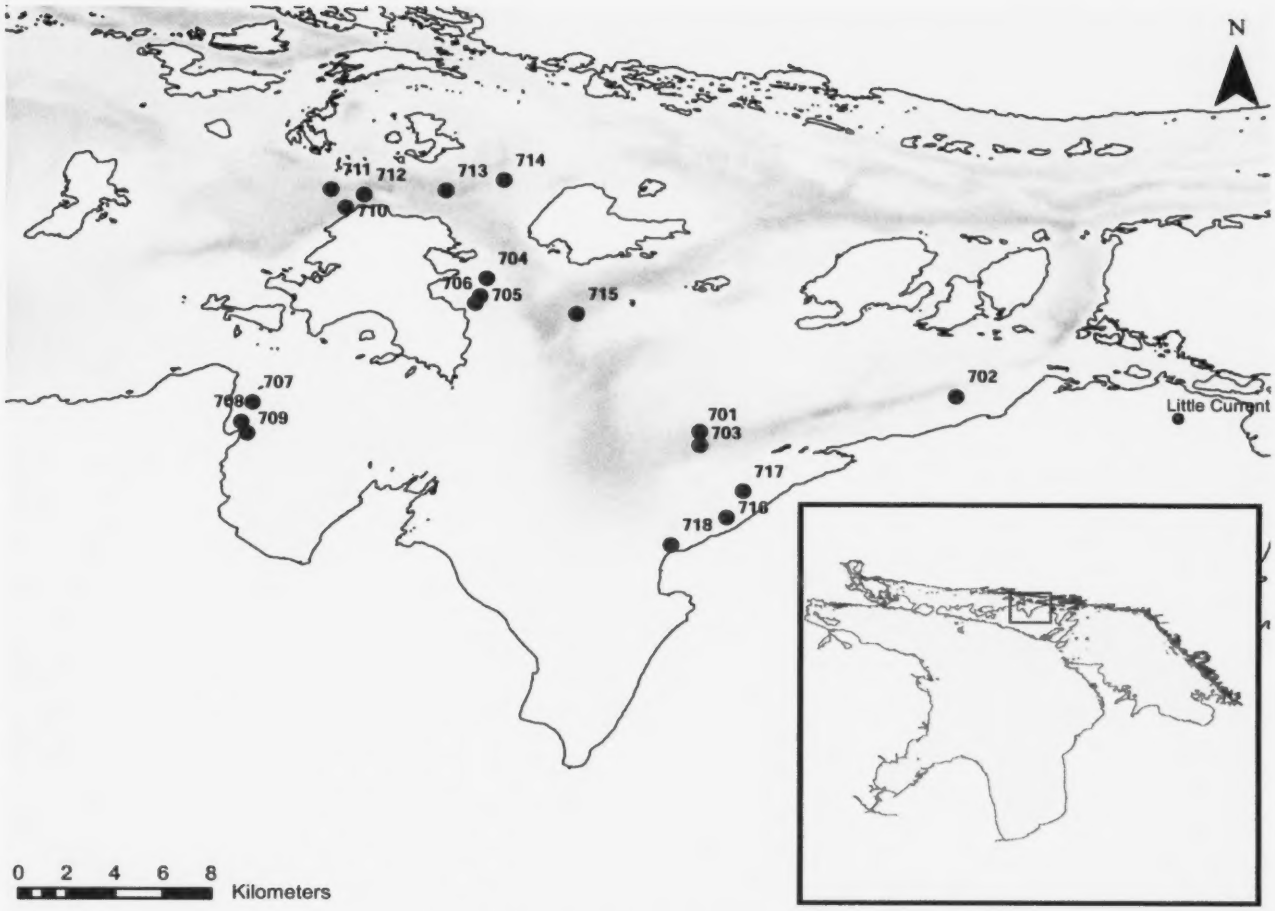

Figure 33. Offshore index sampling locations in the North Channel near Clapperton Island during 2009 (project code LHA_IA09_007). Lake trout, lake whitefish, and yellow perch were targeted.

Table 16. Count of the number of fish by species caught in each mesh size of the gill nets set in the North Channel near Clapperton Island during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Burbot	2		1	2	2	8	8	3				26	4.33
Chub	4	2										6	6.00
Cisco		3	3	4	4	3						17	1.70
Lake Chub	1											1	1.00
Lake Trout			2	7	10	6	6	12	1			44	2.00
Lake Whitefish			1		4	14	10	6	2	1		38	4.17
Rainbow Smelt	1		4	6	1							12	2.00
Rainbow Trout			1									1	1.00
Rock Bass			3	2								5	1.67
Round Goby	3											3	1.50
Round Whitefish			3	3								6	1.20
Trout-perch	6											6	2.00
Walleye						2	1	1	2			6	2.00
White Sucker		1	8	22	14	23	25	20	4			117	13.00
Yellow Perch	26	89	163	70								348	38.00
Total	43	95	189	116	35	56	50	42	9	1	0	636	

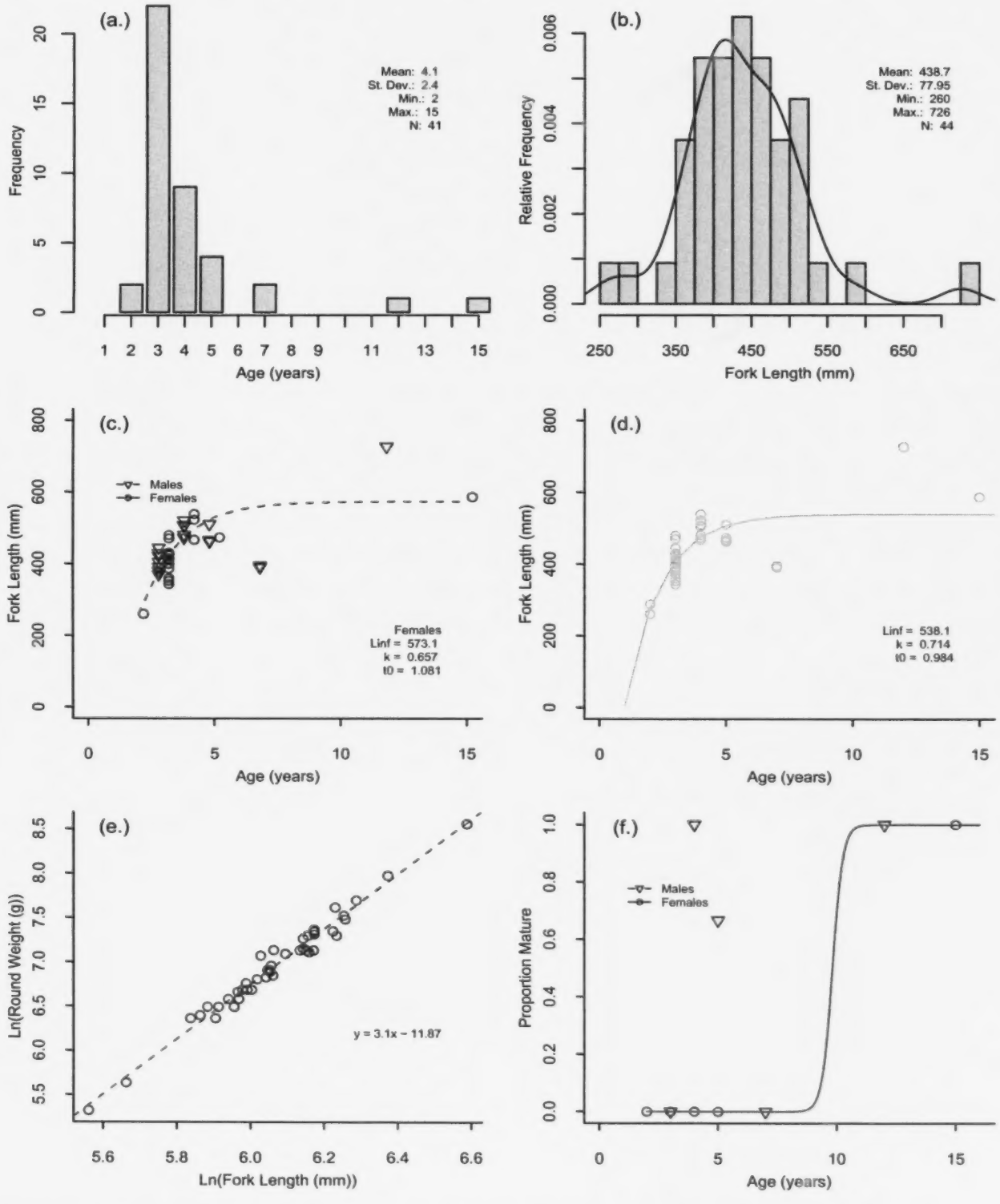

Figure 34. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Clapperton Island project (LHA_IA09_007).

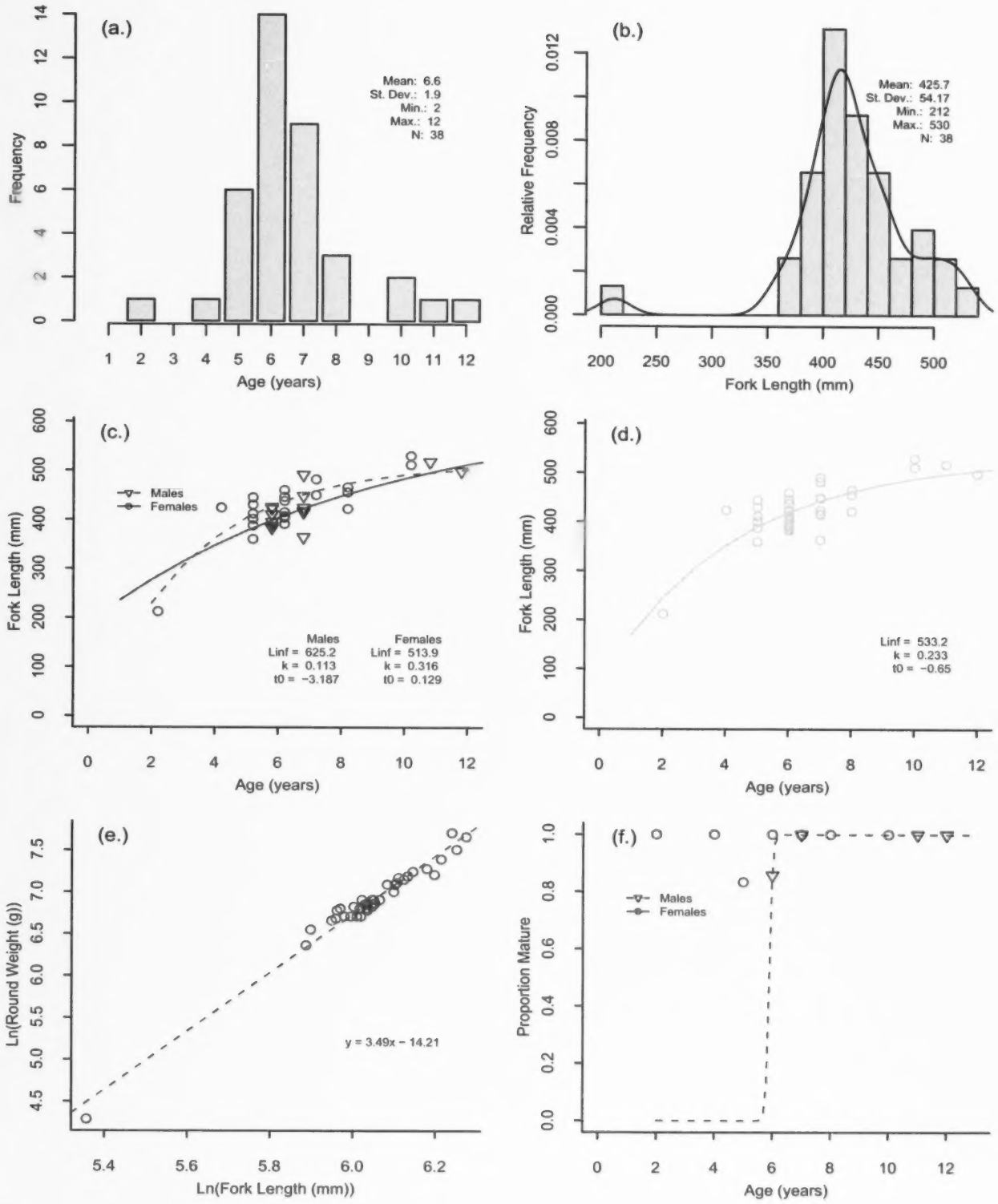

Figure 35. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Clapperton Island project (LHA_IA09_007).

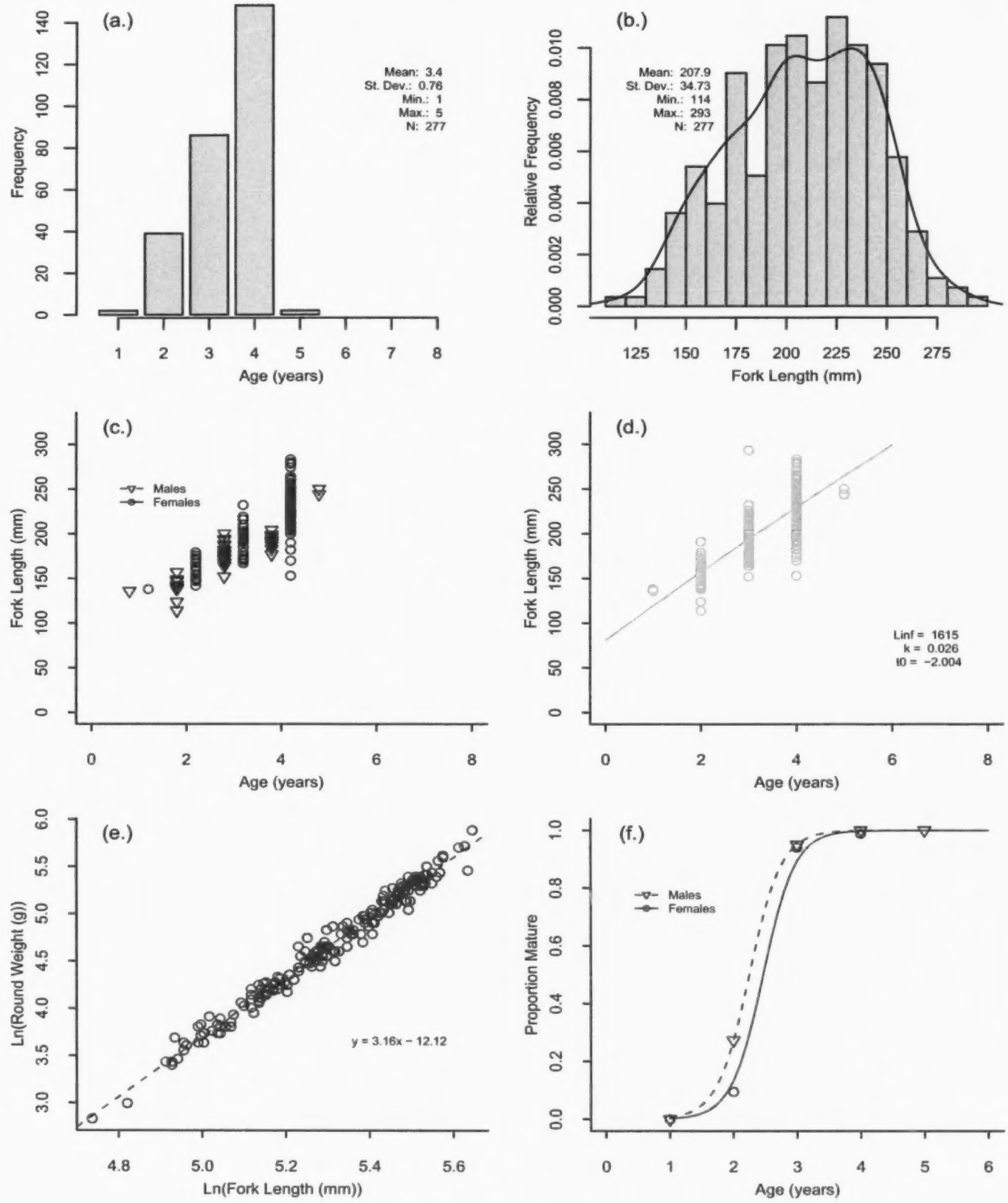

Figure 36. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the Clapperton Island project (LHA_IA09_007).

North Channel (Cooperative Index) **[LHA_IA09_028]**

This first-time index project was run with the assistance of the Ontario Commercial Fisheries' Association in the central portion of the North Channel. This project was run using standard index gear (GL21) set from a commercial fishing vessel to expand the spatial and temporal coverage of the offshore index program in the North Channel. One-third of the nets were set above the lake's bottom (canned). In an attempt to set nets in the thermocline, the depth at which the bottom of these canned nets were set below the water's surface was 17 m or half of the water depth if the water depth was less than 20 m. The project ran between August 16 and August 21 (Table 17). The depth of the nets ranged between 9.5 m and 77.9 m and encompassed three depth strata: <25 m, 30-50 m, and >60 m. All 31 net sets were approximately 24 hours in duration. No specific species was targeted. The position of each net is shown in Figure 37.

Sixteen fish species were caught during this project (Table 18). The most common species were lake whitefish (17.2 % of the catch), rainbow smelt (*Osmerus mordax*, 16.9 %), and chub (15.0 %). Plots of the biological attributes of the lake trout (Figure 38), lake whitefish (Figure 39), cisco (Figure 40), round whitefish (Figure 41), chub (Figure 42), and yellow perch (Figure 43) captured during this project were constructed.

Average CPUE for this project was 23.3 fish/night. Yellow perch had the highest mean CPUE (19.0), followed by white sucker (14.3), and lake whitefish (8.9). Rainbow smelt were caught in every mesh size.

Table 17. Set information for the fishing gear deployed in the North Channel by the Ontario Commercial Fisheries' Association as part of the 2009 offshore index program. Set type is either Bottom (B) or canned (C).

Sample Number	Set Type	Set Date	Latitude	Longitude	Gear Code	Effort Duration (hrs)	Gear Depth (m)
1	B	16-Aug-09	45° 55.85'	-83° 13.84'	GL21	22.61	77.9
2	B	16-Aug-09	45° 59.21'	-83° 12.32'	GL21	22.35	75.3
2	C	16-Aug-09	45° 59.21'	-83° 12.32'	GL21	22.35	29.0
3	B	16-Aug-09	46° 02.50'	-83° 12.90'	GL21	22.91	52.4
3	C	16-Aug-09	46° 02.50'	-83° 12.19'	GL21	22.91	29.0
4	B	16-Aug-09	46° 04.72'	-83° 14.04'	GL21	22.73	48.1
5	B	17-Aug-09	45° 58.58'	-83° 00.30'	GL21	23.33	20.3
6	B	17-Aug-09	46° 02.82'	-82° 58.44'	GL21	23.50	43.1
7	B	17-Aug-09	46° 04.68'	-83° 10.98'	GL21	19.41	33.3
7	C	17-Aug-09	46° 04.68'	-83° 10.98'	GL21	19.41	17.0
8	B	17-Aug-09	46° 06.78'	-83° 09.46'	GL21	18.16	14.2
8	C	17-Aug-09	46° 06.78'	-83° 09.46'	GL21	18.16	9.5
9	B	17-Aug-09	46° 07.12'	-83° 01.76'	GL21	21.16	18.7
10	B	18-Aug-09	46° 07.04'	-82° 38.58'	GL21	19.91	19.6
10	C	18-Aug-09	46° 07.04'	-82° 38.58'	GL21	19.91	12.0
11	B	18-Aug-09	46° 06.35'	-82° 38.35'	GL21	18.66	23.6
11	C	18-Aug-09	46° 06.35'	-82° 38.35'	GL21	18.66	17.0
12	B	18-Aug-09	46° 04.84'	-82° 32.41'	GL21	16.75	33.6
13	B	18-Aug-09	46° 06.38'	-82° 27.66'	GL21	15.66	27.9
14	B	19-Aug-09	46° 03.97'	-82° 37.03'	GL21	23.33	19.1
14	C	19-Aug-09	46° 03.97'	-82° 37.03'	GL21	23.33	17.0
15	B	19-Aug-09	46° 01.86'	-82° 41.51'	GL21	21.33	35.9
15	C	19-Aug-09	46° 01.86'	-82° 41.51'	GL21	21.33	17.0
16	B	19-Aug-09	45° 59.55'	-82° 43.03'	GL21	19.91	26.5
17	B	19-Aug-09	45° 57.81'	-82° 44.25'	GL21	18.66	27.6
18	B	20-Aug-09	46° 03.33'	-82° 16.66'	GL21	19.00	30.0
19	B	20-Aug-09	46° 05.28'	-82° 10.80'	GL21	19.33	10.8
20	B	20-Aug-09	46° 04.47'	-82° 07.79'	GL21	20.83	35.4
20	C	20-Aug-09	46° 04.47'	-82° 07.79'	GL21	20.83	17.0
21	B	20-Aug-09	45° 59.05'	-82° 09.00'	GL21	15.50	44.2
21	C	20-Aug-09	45° 59.05'	-82° 09.00'	GL21	15.50	17.0

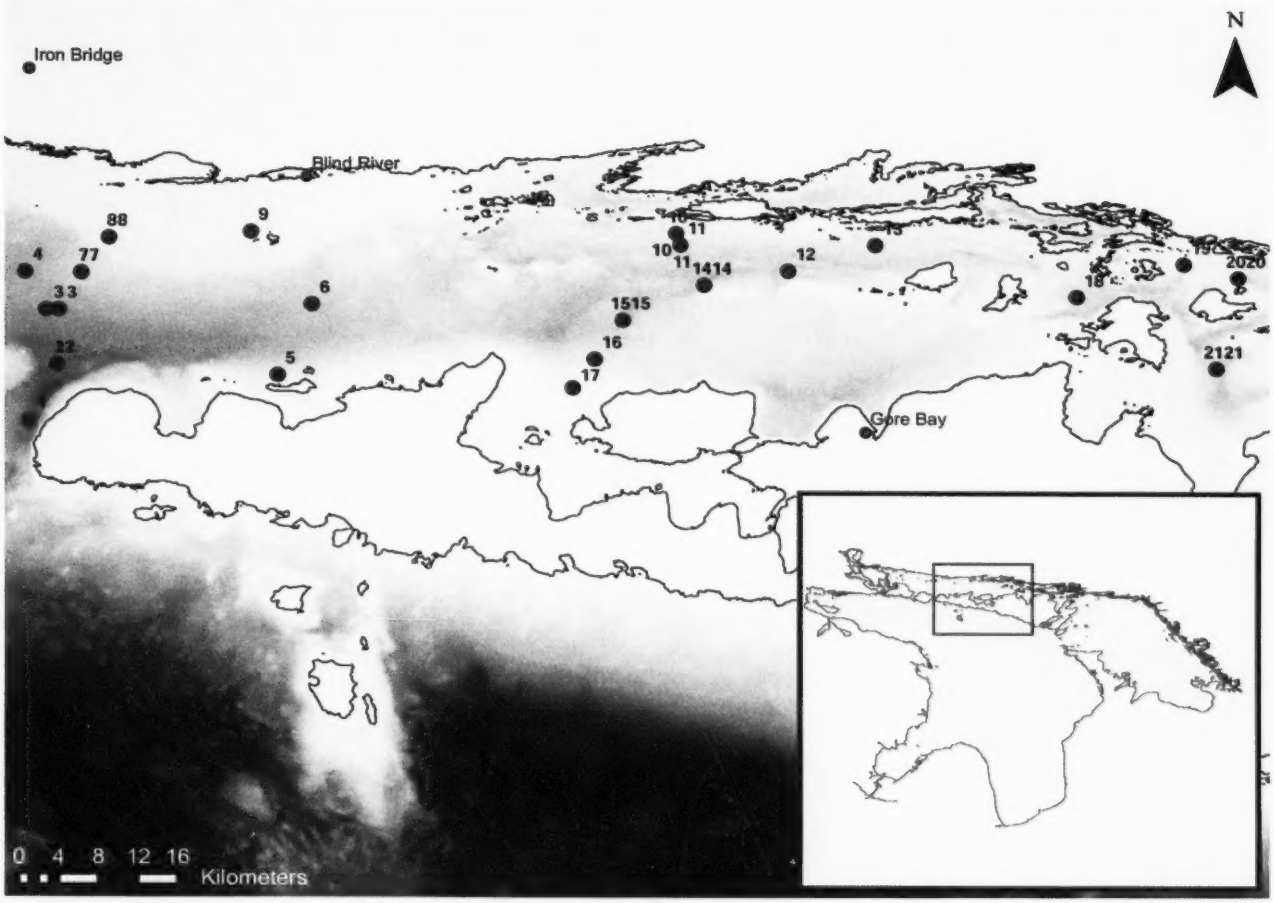

Figure 37. Offshore index sampling locations in the North Channel set by the Ontario Commercial Fisheries' Association during 2009 (project code LHA_IA09_028). Locations with two labels indicte that both bottom-set and canned nets were deployed at that location (see Table 17). No specific species was targeted.

Table 18. Count of the number of fish by species caught in each mesh size of the gill nets set in the North Channel by the Ontario Commercial Fisheries' Association during the 2009 offshore index program. Catch per unit effort (CPUE) is the mean number of fish caught per net each night.

	Mesh Size (mm)												
Species	**032**	**038**	**051**	**064**	**076**	**089**	**102**	**114**	**127**	**140**	**153**	**Total**	**CPUE**
Burbot			1	3	6	5	2	2		1		20	2.22
Chub	51	39	13	3	1				1			108	7.20
Cisco	2	8	15	5	15	14	2	2				63	4.50
Darters	1											1	1.00
Lake Chub	1											1	1.00
Lake Sturgeon											1	1	1.00
Lake Trout					4	3	9	10	4	2	1	33	4.71
Lake Whitefish	2	5	9	20	18	22	25	18	3	1	1	124	8.86
Longnose Sucker			2	2	4			1				9	3.00
Rainbow Smelt	10	21	31	23	6	6	7	6	5	4	3	122	6.42
Redhorse Suckers	4		1	1				1				7	2.33
Round Goby	3	1										4	1.00
Round Whitefish	1	1	26	22	16	5	1	1				73	8.11
Walleye		2	5	2	2	1						12	4.00
White Sucker	4	1	17	10	19	20	1	4	10			86	14.33
Yellow Perch	4	15	35	2	1							57	19.00
Total	83	93	155	93	92	76	47	45	23	8	6	721	

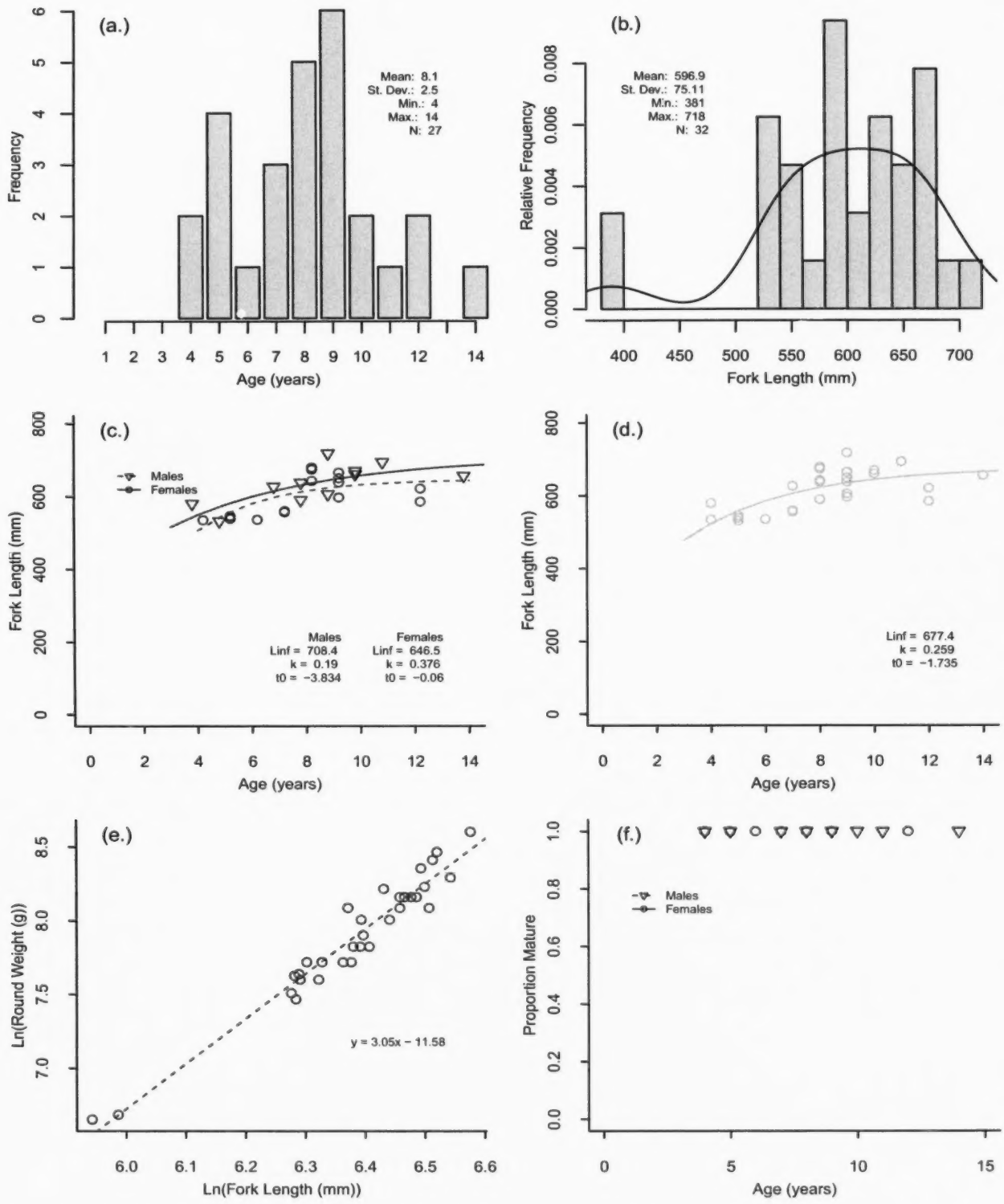

Figure 38. Lake trout age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

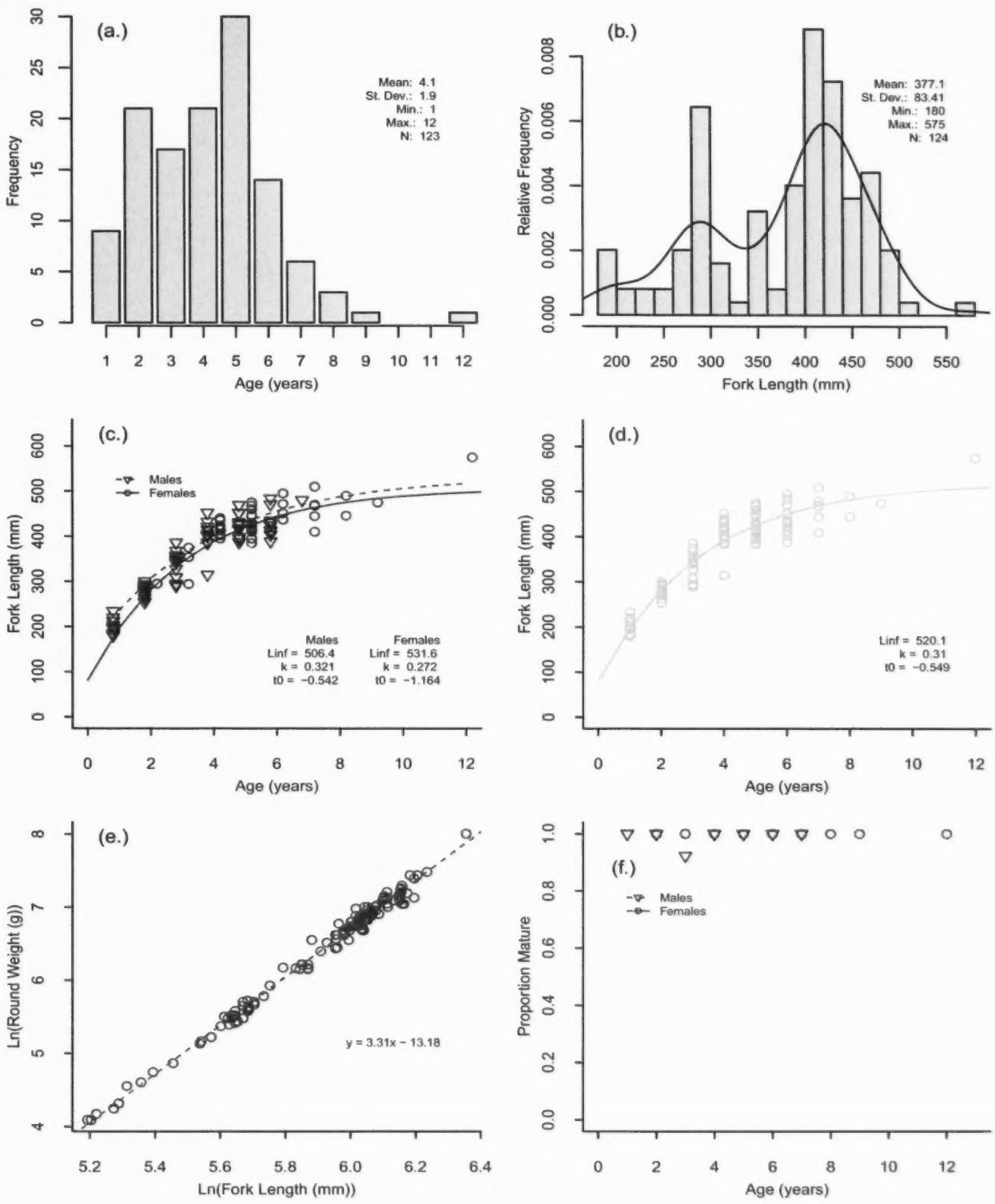

Figure 39. Lake whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

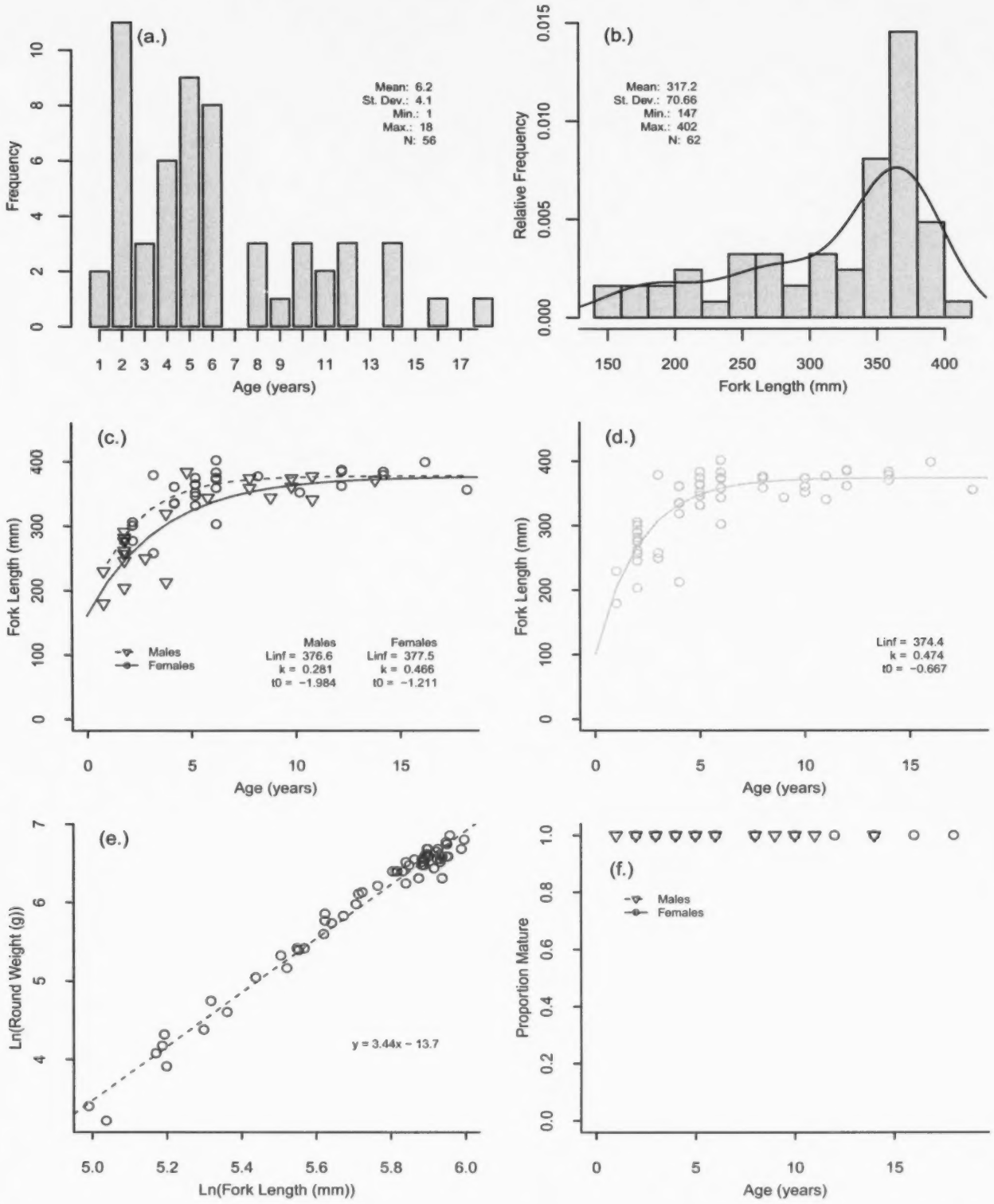

Figure 40. Cisco age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

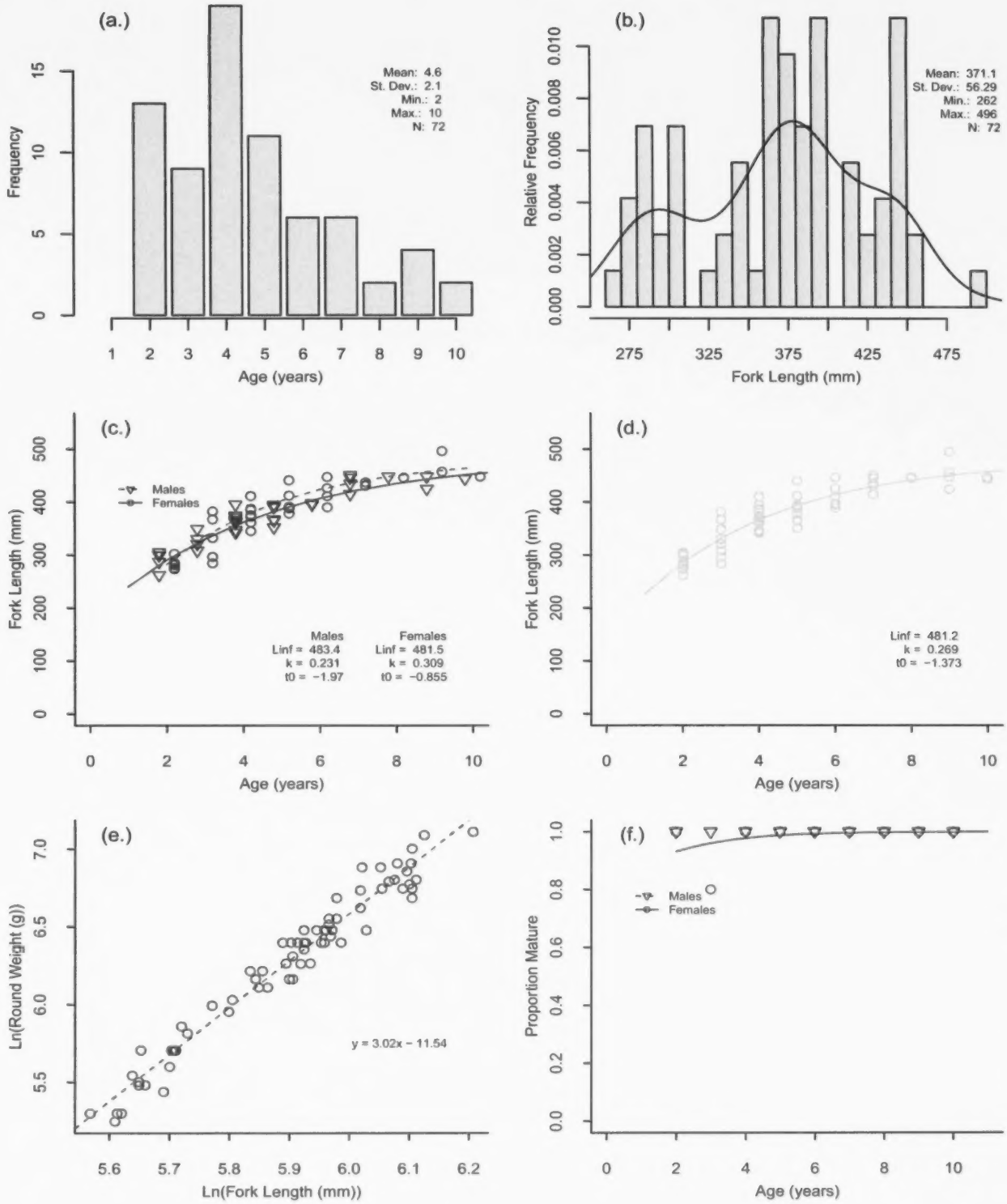

Figure 41. Round whitefish age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

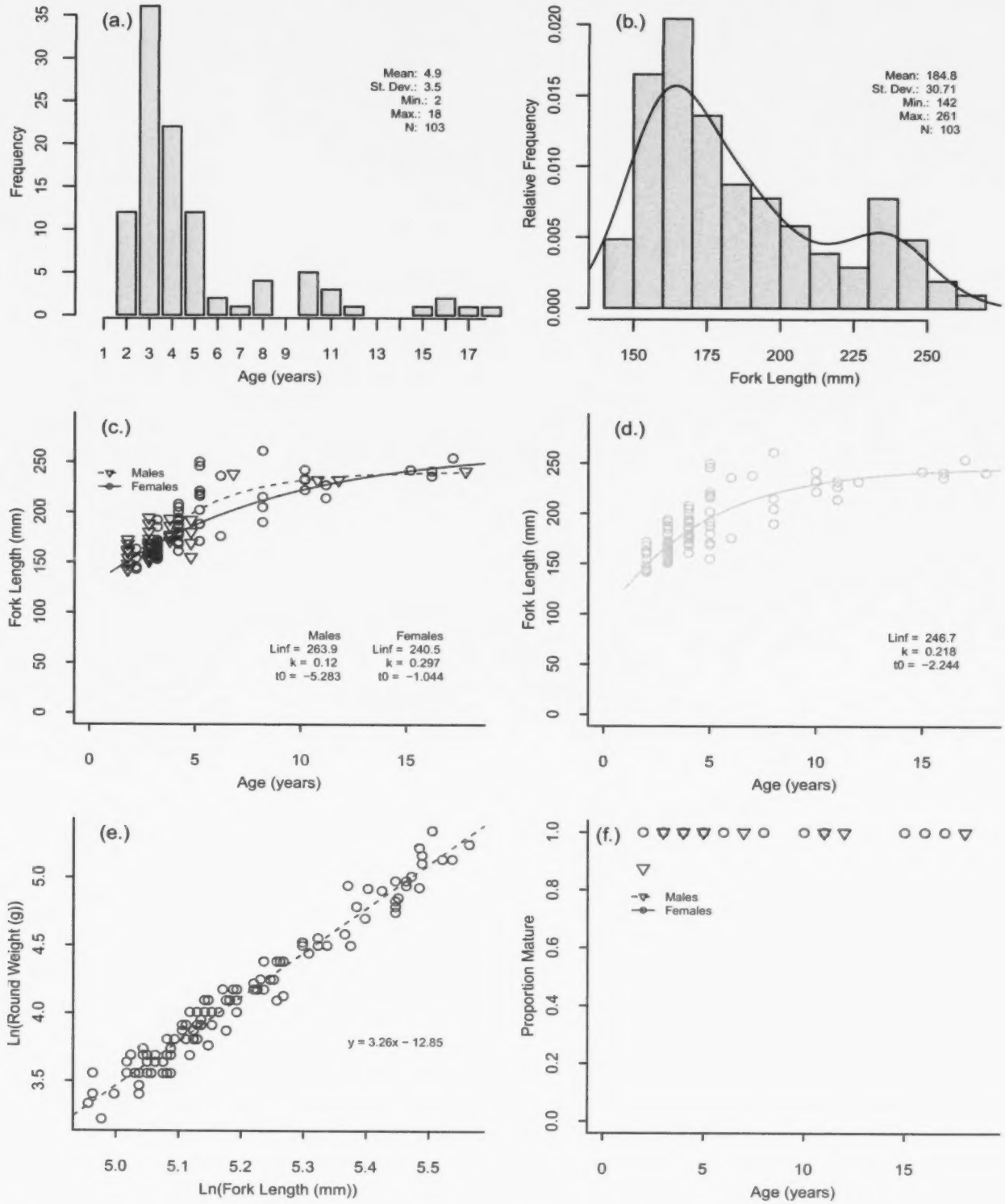

Figure 42. Chub age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

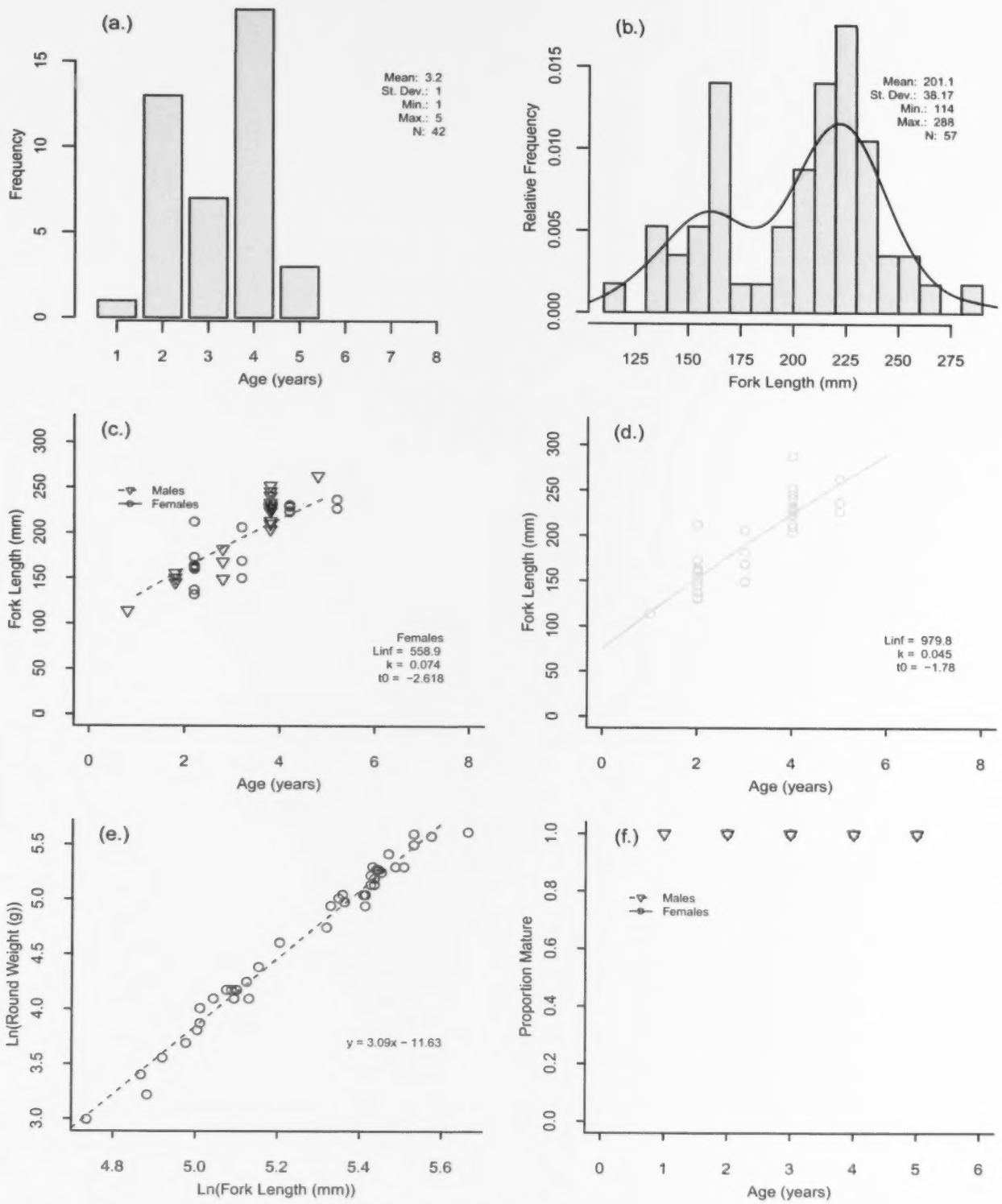

Figure 43. Yellow perch age distribution (a), fork length distribution (b), fork length-at-age (by sex (c) and all fish combined (d)), weight-at length (e), and maturity-at-age (f) from the OCFA North Channel project (LHA_IA09_028).

Pre-Recruit Indices

Lake Whitefish

In general, the strength of the recent year classes of lake whitefish have been improving (Table 19). In the central main basin a strong 2008 year class has emerged. The last strong year class was the 2003 year class. This year class still persists in very low numbers in the catch. In Georgian Bay there has not been a strong year class since the 2001 year class. While this year class is still present in the fishery, the 2003 year class made up a significant portion of the catch in this year's program. This was unexpected given its poor representation in the catch in previous years. The strength of the year classes in the southern main basin are nearly opposite to the previous two regions. In the southern main basin relatively strong year classes have been produced consistently after 2002, although year classes after 2005 have been depleted rapidly and the 2008 year class is the weakest since the 2002 year class.

Chub

The strength of the year classes of chub is very different between the central and southern portions of the main basin (Table 19). The central main basin has produced weak year classes of chub every year after the 2000 year class. In contrast, the southern main basin has produced strong year classes from 2003 to 2005. However, the strength of the 2006 year class in this region is well below the long-term average. Pre-recruit indices for chub have not been calculated after the data collected during the 2008 offshore index program because not enough data have been available in recent years.

Yellow Perch

The strength of the year classes of yellow perch is highly variable throughout Lake Huron (Table 19). In the central main basin there have been two recent, strong year classes; 2006 and 2007. The opposite trend has occurred in the North Channel, where 2005 was a strong year class and the 2006 to 2008 year classes were very weak. In the southern main basin the last strong year class was the 2003 year class, which is now present in very low numbers. However, the 2007 year class is only slightly weaker than the long-term average, an improvement from the weak year classes between 2004 and 2006. The 2008 year class appears to be weak in all regions.

Table 19. Pre-recruit indices for lake whitefish, chub, and yellow perch from select Quota Management Areas (QMAs) in Lake Huron. Indices for each QMA are calculated using data from their respective projects; 4-4 from the central main basin, 4-5 from the southern main basin, 5-8 from southern Georgian Bay, and 6-1 from the North Channel.

		Lake Whitefish			Chub		Yellow Perch		
	QMA	4-4	4-5	5-8	4-4	4-5	4-4	4-5	6-1
Year	Cut Off	1	10	1	1	20	1	20	1
Class	Ages	1-3	1-3	1-3	2-4	2-4	1-3	1-3	1-4
1988									
1989					13.86	23.81			
1990		32.65	15.60	27.35	21.95	13.87	11.26	19.05	10.45
1991		16.56	12.97	11.96	4.49	6.16	74.05	20.06	10.56
1992		11.77	2.42	6.93	0.75	0.98	1.05	0.70	0.52
1993		8.82	12.83	8.99	2.81	3.91	9.87	8.27	6.79
1994		8.25	6.42	1.50	3.05	7.62	1.08	25.46	4.05
1995		7.17	7.38	14.55	4.75	6.37	3.20	19.12	9.01
1996		9.14	5.18	7.21	5.34	4.96	0.14	2.37	6.53
1997		6.25	9.72	1.67	15.65	6.53	0.99	4.86	15.12
1998		23.26	17.47	16.50	33.32	14.35	20.37	43.22	26.94
1999		22.54	9.08	50.63	27.32	11.88	1.61	3.84	7.34
2000		7.87	4.95	19.63	21.55	6.03	2.54	1.21	6.77
2001		7.14	6.74	20.35	7.24	0.00	3.78	2.17	0.38
2002		2.48	4.24	3.15	1.76	5.73	2.62	6.21	8.94
2003		22.33	28.91	0.44	2.07	24.04	8.13	23.47	7.91
2004		4.31	12.56	0.05	2.01	27.39	2.63	3.12	10.05
2005		1.40	12.11	0.56	0.00	21.91	7.91	4.00	36.54
2006		0.00	7.23	0.11	0.00	2.30	11.49	3.16	6.59
2007		0.40	10.21	0.16			57.83	8.09	0.85
2008		15.25	2.97	1.61			2.78	3.90	0.00
Mean		10.93	9.95	10.18	9.33	10.44	11.75	10.65	9.23

Discussion

One fewer fish species and less individuals were caught this year compared to last year. This is unexpected because effort increased from 164 nets in 2008 to 208 nets in 2009. The number of species captured this year decreased by 1 to 27, a value still within the typical range encountered over the offshore index program's history. CPUE decreased from the slightly elevated 59.4 in 2008 to a record low of 26.4 in 2009. This low CPUE is consistent with the low CPUEs observed over the past seven years. The species captured most frequently remained yellow perch and lake whitefish. White sucker replaced chub as the third most commonly caught species.

Some fish species had interesting changes in CPUE or distribution. In 2008 burbot (*Lota lota*) was the most common species caught in southern Georgian Bay. In 2009 the prevalence of burbot in the catch declined to more typical levels. The high CPUE of cisco observed around Clapperton Island in 2008 has returned to the low levels seen prior to 2001. The CPUE of cisco in the main basin remains low. The CPUE of cisco in the new locations in the North Channel (Cooperative) and the central main basin (Stokes Bay) were very high compared to the traditional locations in these regions (near Clapperton Island and Southampton, respectively). The high CPUE of white bass (*Morone chrysops*) caught in the southern main basin in 2008 was not observed again in 2009; only one individual was caught. Round goby (*Neogobius melanostomus*) were caught during all projects. However, round goby remain a very small component of the catch in each of these locations.

The CPUE of walleye in the southern main basin continues to drop from the high values observed in 2007. The CPUE of walleye fell from 3.0 in the spring in 2007 to 2.3 this year and 5.0 in the fall in 2007 to 2.1 this year. This is largely due to a reduction in the frequency of the very strong 2003 year class in the catch. The 2004 and 2005 year classes appear to be much weaker than the 2003 year class.

Lake Whitefish Trends

In southern Georgian Bay the CPUE of lake whitefish increased from its near-record low in 2008, reducing the severity of the downward trend which began in 2004. Last year the 2001 and 2002 year classes made up a significant portion of the catch in southern Georgian Bay near Cape Rich. While both year classes were caught again this year, their frequency was reduced and they were not nearly as abundant as the 2003 year class. In the Collingwood project, CPUE was higher and the 2003 and 2007 year classes dominated the catch. The 2006 year class dominated the catch around the Watcher Islands. The absence of strong year classes after 2001 around Cape Rich

suggests that the lake whitefish population in southern Georgian Bay may be undergoing major changes. These changes are likely associated with the decline of *Diporeia sp.* in southern Georgian Bay, an important food source for this species. The decline of *Diporeia sp.* in other parts of the Great Lakes has resulted in substantial changes to the distribution, growth, condition, and maturity of lake whitefish in those areas (Nalepa *et al.* 2005; Hoyle 2005). A similar change in the population characteristics of lake whitefish may be occurring in southern Georgian Bay.

The CPUE of lake whitefish in the central main basin has remained relatively stable for the past six years. In 2008 CPUE during the fall dropped to its lowest level in more than 20 years. In 2009 CPUE did increase, but it remains well below the long-term average. The catch in this region was largely dominated by fish older than six, both off of Southampton and Stokes Bay. However, the 2008 year class was the most abundant year class in the catch near Southampton. The 2004 and 2005 year classes were more abundant in Stokes Bay while the 2008 year class was not caught in this location.

The CPUE of lake whitefish in the southern main basin has remained stable since 2005. The 2004 and 2005 year classes have made up most of the catch in past years and 2009 was no different. The 2006 year class was also prevalent in the fall. Unlike the central main basin, older fish were much less prominent in this location.

Lake Trout Trends

The CPUE of lake trout has remained relatively stable in the main basin. In the southern main basin CPUE tends to be a little higher in the fall than in the spring. The mean age of lake trout sampled in the central main basin has steadily increased from 4.6 in 2003 to 7.2 in 2009 and in the southern main basin from 4.7 in 2003 to 6.7 in 2009. The mean age in Stokes Bay was 8.1. The broad age distribution of lake trout with many mature year classes is encouraging from a lake trout rehabilitation perspective.

Unlike the stable CPUE observed in the main basin, the CPUE of lake trout in southern Georgian Bay has been increasing since 2007. CPUE increased from 2.6 in 2008 to 5.3 in 2009. However, CPUE still remains well below those values observed prior to 2004. CPUE from the project around the Watcher Islands was lower at 1.6 and very low near Collingwood at 0.2. The 2004 and 2005 year classes were the most abundant in the catch off of Cape Rich, although the 2002 and 2003 year classes were also frequently caught. The 2006 and 2007 year classes were the most abundant around the Watcher Islands.

Over 70 unclipped lake trout were observed during the offshore index program this year, most of which were from the projects near Southampton, Grand Bend, and Cape Rich. Unclipped lake trout in the central main basin near Southampton rose to 26.9 % of the lake trout which were examined for clipped fins. The percentage of unclipped lake trout in this location has been increasing steadily since the early 1990s. The project near Stokes Bay also produced a high percentage of unclipped lake trout (29.3 %). In the southern main basin the percentage of unclipped trout has been increasing rapidly since 2006; presumably wild fish comprised 47.6 % of the lake trout checked for fin clips. A near record-high percentage of unclipped lake trout were also captured off of Cape Rich in southern Georgian Bay (30.6 %). This is down from 33.3 % observed last year but still well above the long-term average. Unclipped lake trout composed 6.8 % of all lake trout captured near the Watcher Islands that were checked for fin clips and no unclipped fish were captured near Collingwood. In the North Channel 16.1 % of the lake trout checked for fin clips during the North Channel cooperative index were unclipped while no unclipped trout were caught around Clapperton Island.

Yellow Perch Trends

The CPUE of yellow perch in the central main basin remains unstable and highly variable over the last 15 years. This year the CPUE of perch was consistent with the long-term average. The strong 2007 year class comprised much of the catch while the once-strong 2006 year class was much less common than it was in 2008. The age composition of the perch population from the project near Stokes Bay cannot be established because only two perch were caught.

In the southern main basin the CPUE of yellow perch was comparable to those observed over the last eight years. CPUE in the fall was higher than the long-term average while CPUE in the spring was lower. The 2007 year class dominated the catch, although the 2006 year class had a stronger presence in the spring. The high frequency of the 2006 and especially the 2007 year classes in the catch was surprising because pre-recruit analysis indicates that these two year classes were weaker than the long-term average. However, the pre-recruit index is a composite value based on several years of observations.

In the North Channel the catch of yellow perch declined dramatically after the high observed in 2008. CPUE in 2009 was more than 60 % lower than what it was in 2008. However, CPUE is still higher than the record lows seen in 2003 and 2004. The CPUE of perch from the North Channel cooperative index was also relatively low. The 2005 year class remains very strong around Clapperton Island; it dominated the catch both this year and last year. The 2006 year class was also prominent in the catch. Both the 2005 and 2007 year classes were prominent in the catch from the

North Channel cooperative index. The general absence of yellow perch older than age five is a concern in the North Channel; older fish should be present because there is currently very little commercial fishing effort targeting them.

Chub Trends

Chub in southern Georgian Bay and the central main basin continue to be present in very low numbers. The CPUE of chub in southern Georgian Bay increased slightly this year, partially because some nets were set to target them specifically. In the central main basin chub CPUE remained low as well. In both southern Georgian Bay and the central main basin the catch was dominated by the 2006 and 2007 year classes. However, all year classes remain very weak compared to the long-term average. The CPUE of chub in the new projects (Collingwood, Stokes Bay, and the Watcher Islands) was also quite low.

In the southern main basin the CPUE of chub remains higher in the fall than in the spring. All ages younger than eight are common, a change from the catch last year which was dominated by fish ages two and three. The once-strong 2003 and 2004 year classes are now roughly present with equal frequency as the other year classes after the 2001 year class. The mean age of chub in this location climbed to 5.0 this year; an average age this high has not been observed since 2003. Fish large enough to be captured in mesh larger than 51 mm remain rare.

Summary

All of the projects planned for the 2009 offshore index program were completed successfully. The projects run near Collingwood, Stokes Bay, and the Watcher Islands all went well. Slime did not impede the effectiveness of any of the fishing gear. Useful data was also obtained from the North Channel cooperative index project.

In general, the species diversity observed from the 2009 offshore index program was slightly lower than the species diversity observed from last year's program. Thirteen species were caught off of Southampton in the central main basin during the fall, down from 15 in 2008. This is noteworthy because effort increased in this project in 2009; 18 nets were set in 2008 while 27 were set in 2009. This drop in species diversity was also evident in the southern main basin during the spring; 13 species were caught during 21 net sets in 2008 while 12 species were caught during 30 net sets in 2009. During the fall the number of species captured dropped from 18 to 13. However, the number of net sets also dropped from 27 to 6. The following species were caught in 2008 but not 2009: bowfin (*Amia calva*), freshwater drum (*Aplodinotus grunniens*), brown trout, and white perch

(*Morone americana*). Coho salmon (*Oncorhynchus kisutch*) were caught in 2009 but not in 2008. Round goby remains a relatively small portion of the catch.

The strength of the chub, lake whitefish, and yellow perch populations varies by location. The 2004 and 2005 year classes of lake whitefish remains strong in the southern main basin. However, pre-recruit indices indicate that the 2008 year class is much weaker than average. The pre-recruit index forecasts a strong 2008 year class in the central main basin. The past three year classes in this region have all been weak. The last strong year class in southern Georgian Bay was the 2001 year class. Chub from ages 3 to 7 were all caught with approximately the same frequency in the southern main basin. The latest (2006) pre-recruit estimates in both the southern and central main basins forecast weak year classes. In the central main basin a strong year class has not occurred since 2000. The 2007 year class of yellow perch that dominates the southern and central main basins is very weak in the North Channel, where the 2005 year class still dominates.

The proportion of unclipped lake trout continues to rise in the main basin projects, especially in southern Lake Huron. While a high percentage (30.6 %) of unclipped lake trout was seen again in southern Georgian Bay this year, overall abundance continues to be lower than in the past. The percentage of unclipped lake trout observed near Stokes Bay was also high at 29.3 %. Of the 52 lake trout that were sampled from central Lake Huron, 26.9 % were unclipped and thus potentially wild individuals.

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